

AM/FM STEREO RECEIVER
SX-1250

<ART-158-0>

Service Manual



 **PIONEER®**

MODEL SX-1250 COMES IN THREE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KCU	120V only	CSA (Canada) and UL (U.S.A) approved with de-emphasis selector switch (25 μ s/75 μ s)
HG	220V and 240V (Switchable)	SEMKO (Sweden), NEMKO (Norway), DEMKO (Denmark) and EI (Finland) approved
S	110V, 120V, 220V and 240V (Switchable)	General export model with de-emphasis selector switch (25 μ s/50 μ s/75 μ s)

When repairing S or HG type, please see the manual on page 101.

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1. SPECIFICATIONS

Semiconductors

FETs	5
ICs	6
Transistors	82
Diodes	60

Power Amplifier Section

Continuous Power Output from 20 Hertz to 20,000 Hertz
(Both channels driven) . . 160 watts per channel (8 ohms)
200 watts per channel (4 ohms)

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, from
AUX)

Continuous Rated Power Output. . . No more than 0.1%
80 watts per channel power

output, 8 ohms No more than 0.05%
1 watt per channel power

output, 8 ohms No more than 0.07%

Intermodulation Distortion (50 Hertz : 7,000 Hertz = 4 : 1,
from AUX)

Continuous Rated Power Output. . . No more than 0.1%
80 watts per channel power

output, 8 ohms No more than 0.05%
1 watt per channel power

output, 8 ohms No more than 0.07%

Frequency Response 5Hz to 100,000Hz ± 1 dB

Input Sensitivity/Impedance

POWER AMP IN 1 V/50k ohms

Output

Speaker A, B, C, A+B, B+C, A+C

Headphone Low Impedance

Damping Factor

(20Hz to 20,000Hz, 8 ohms) 30

Hum and Noise (IHF, short-circuited, A Network) . . 100dB

Preamplifier Section

Input Sensitivity/Impedance

PHONO 1 2.5mV/50k ohms

PHONO 2 2.5mV/50k ohms

MIC 6.5mV/50k ohms

AUX 150mV/50k ohms

TAPE PLAY 1 150mV/50k ohms

TAPE PLAY 2 150mV/50k ohms

TAPE PLAY 2 (DIN connector) 150mV/50k ohms

PHONO Overload Level (T.H.D. 0.1%)

PHONO 1 500mV (1kHz)

PHONO 2 500mV (1kHz)

Output Level/Impedance

TAPE REC 1 150mV

TAPE REC 2 150mV

TAPE REC 2 (DIN connector) 30mV/80k ohms

PRE OUT 1V/1k ohms

Total Harmonic Distortion

(20Hz to 20,000Hz, 1V output) . . No more than 0.02%

Frequency Response

PHONO (RIAA equalization) . . 30Hz to 15,000Hz ± 0.2 dB

AUX, TAPE PLAY 10Hz to 50,000Hz ± 1 dB

Tone Control

BASS MAIN ± 10 dB (100Hz)

SUB ± 5 dB (50Hz)

TREBLE MAIN ± 10 dB (10kHz)

SUB ± 5 dB (20kHz)

Filter

LOW 30Hz (12dB/oct.)

HIGH 8kHz (12dB/oct.)

Loudness Contour (Volume control set

at -40dB position) +6dB (100Hz), +3dB (10kHz)

Hum and Noise (IHF, short-circuited, A Network, rated
power)

PHONO 75dB

AUX, TAPE PLAY 90dB

Muting -20dB

FM Section

Usable Sensitivity. . . MONO . . . 8.7dBf (3.0 μ V/300 Ω)

STEREO . . 14.5dBf (5.8 μ V/300 Ω)

Usable Sensitivity (IHF '58) 1.5 μ V

50dB Quieting Sensitivity

MONO . . . 11.5dBf (4.1 μ V/300 Ω)

STEREO . . 36.0dBf (69 μ V/300 Ω)

Signal-to-Noise Ratio at 65dBf . . MONO 80dB

STEREO 74dB

Distortion at 65dBf 100Hz MONO 0.1%

STEREO 0.25%

1kHz MONO 0.1%

STEREO 0.2%

6kHz MONO 0.3%

STEREO 0.3%

Frequency Response 30Hz to 15,000Hz ± 1.5 dB

Capture Ratio 1.0dB

Alternate Channel Selectivity 83dB

Spurious Response Ratio 110dB

Image Response Ratio 110dB

IF Response Ratio 120dB

AM Suppression Ratio 60dB

Muting Threshold 13dBf (4.9 μ V/300 Ω)

Stereo Separation . . 50dB (1kHz), 35dB (30Hz ~ 15kHz)

Subcarrier Product Ratio 74dB

SCA Rejection Ratio 74dB

Antenna Input 300 ohms balanced

75 ohms unbalanced

AM Section

Sensitivity (IHF, Ferrite antenna)	300 μ V/m
(IHF, Ext. antenna)	15 μ V
Selectivity	40dB
Signal-to-Noise Ratio	55dB
Image Response Ratio	65dB
IF Response Ratio	85dB
Antenna	Built-in Ferrite Loopstick Antenna

Miscellaneous

Power Requirements	120V 60Hz
Power Consumption	650W (UL, CSA) 1200W (max.)
Dimensions	556(W) x 186.5(H) x 464.5(D) mm 21-7/8(W) x 7-3/8(H) x 18-1/4(D) in
Weight Without Package	29.2kg (64 lb 4 oz)
With Package	33.2kg (73 lb 1 oz)

Furnished Parts

FM T-type Antenna	1
Operating Instructions	1
Hex. Wrench	1

NOTE:

Specifications and the design subject to possible modification without notice due to improvements.

HEX WRENCH

The accessory Hex. wrench is provided for removing the VOLUME and TUNING knobs, or for tightening its setscrew in the event it becomes loose.

If required, loosen the setscrew by inserting the wrench into the hole on the side of the knob and turning the wrench counterclockwise. Be particularly careful not to scratch the front panel when employing the wrench.



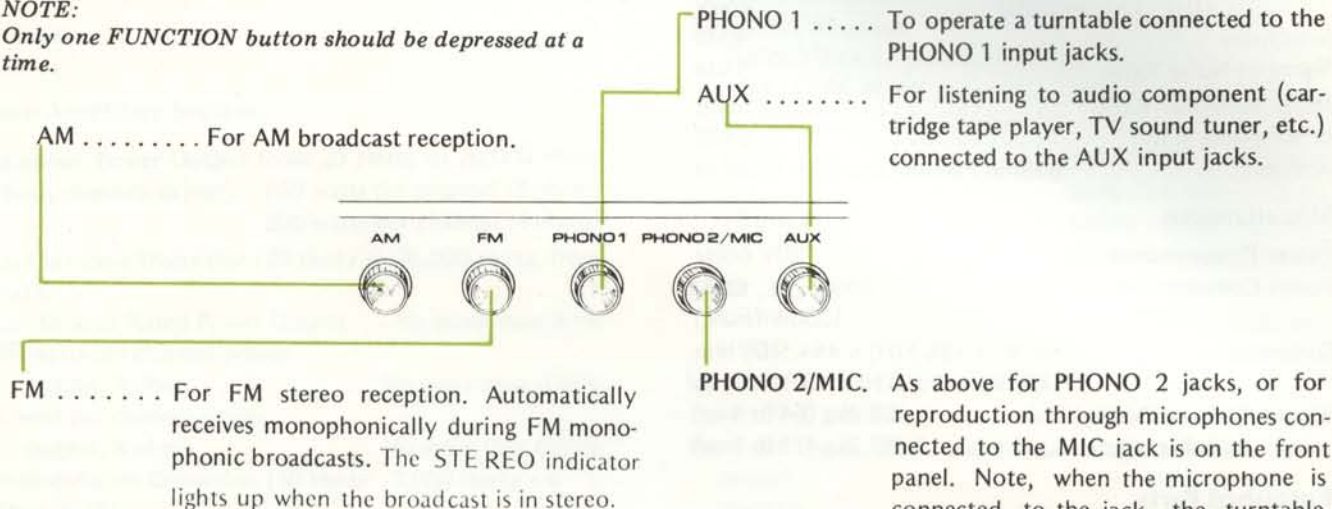
2. FRONT PANEL FACILITIES

FUNCTION SELECTOR BUTTONS

To select the program source, push each button as follows:

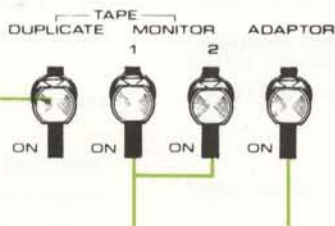
NOTE:

Only one **FUNCTION** button should be depressed at a time.



TAPE DUPLICATE SWITCH

Set this switch in the **ON** (down) position to duplicate or edit a recorded tape using two tape decks.



TAPE MONITOR (1, 2) SWITCHES

Set these switch in the **ON** (down) position as follow:

- 1 With a tape deck connected to the TAPE 1 jacks (REC and PLAY), either playback or monitoring of a recording in progress are possible.
- 2 Same as in 1 above, with a tape deck connected to the TAPE 2 jacks (REC and PLAY).

For normal use, leave in the **OFF** (up) positions.

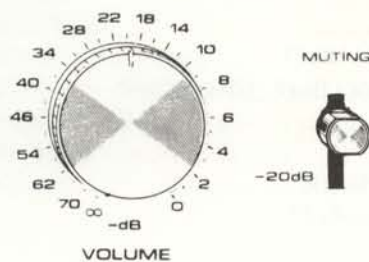
ADAPTOR SWITCH

When employing adaptor components, such as a graphic equalizer adaptor, RG processor, or Dolby NR adaptor, depress this **ADAPTOR** switch to **ON**.

VOLUME CONTROL AND AUDIO MUTING SWITCH

The extremely high power output of the SX-1250 can be finely controlled by combining the calibrated **VOLUME** control and the **AUDIO MUTING** switch.

The **AUDIO MUTING** switch can also be used to briefly lower the volume when changing records or tapes.



SPEAKER BUTTONS

Three sets of speaker terminals, A, B, and C, are provided on the rear panel, and the required speaker systems can be selected by depressing the SPEAKERS buttons as follows:

- A Speaker systems A operate
- B Speaker systems B operate
- C Speaker systems C operate

NOTES:

1. When any two buttons (A+B, B+C, C+A) are depressed simultaneously, the corresponding pairs of speaker systems will come into operation. However, it is not possible to operate all three speaker systems at the same time, even though all the buttons are depressed.
2. For private listening through headphones, return all the SPEAKERS buttons to the OFF (undepressed) position.

FM TUNING METER

With the SIGNAL meter needle deflected to the right, make fine adjustment by centering the FM TUNING meter needle (indicating optimum reception).

SIGNAL METER

For AM and FM station tunings.

AM tuning: Tune for maximum deflection of the SIGNAL meter needle to the right.

FM tuning: Both the SIGNAL and FM TUNING meters work together. The optimum point of the SIGNAL meter needle is the same as in AM tuning. Then use the FM TUNING meters.

TUNING KNOB

Select the station and tune for optimum reception by observing the SIGNAL meter for AM stations, and both SIGNAL and TUNING meters for FM stations.

FM MUTING BUTTON

Leave this button undepressed (in the ON position) to suppress unpleasant interstation noise while tuning between FM stations. Low-strength signals may also be suppressed by this function, so to pick up a weak station depress this button to the OFF position.

PROGRAM SOURCE INDICATOR

**SPEAKER SYSTEM INDICATOR
FM STEREO INDICATOR**

MIC JACKS (L and R)

For connect each channel jacks the left and right channel microphones.

NOTE:

Use the high impedance (above 20kΩ) with 6mm diam. phone plugs.

PHONES JACK

Accepts stereo headphones.

WARNING:

Do not plug a microphone into the PHONES jack as may damage the microphone.

POWER SWITCH

After turning this switch ON there is a delay of some 6 to 8 seconds, during which time the protection circuit operates to eliminate unpleasant noise.

TWIN BASS CONTROLS

Adjust low frequency tone.

100Hz: Adjusts frequency band below 400Hz. Control effectiveness at 100Hz is ±10dB.

50Hz: Provides additional control for the frequency band below 200Hz. Control effectiveness at 50Hz is ±5dB.

TONE SWITCH

In the OFF (up) position, this switch causes the amplifier section to operate with a flat frequency response regardless of the tone control setting.

LOW CUT (30Hz) FILTER BUTTON

When low-pitched rumble (from turntable motor or other source) is obstrusive depress this button to provide 12dB/octave, attenuation at frequencies below 30Hz. If no interference is experienced, release this button.

HIGH CUT (8kHz) FILTER BUTTON

When high frequency scratch noise (from worn records or other source) is unpleasant, depress this button to provide 12dB/octave attenuation at frequencies above 8kHz. If there is no interference, release this button.

FM MULTIPATH BUTTON

When selecting the best position for the FM antenna, depress this button so that multipath noise is heard from the speaker systems. To listen to FM broadcasts, release this button.

TWIN TREBLE CONTROLS

Adjusts high frequency tone.

10kHz: Adjusts frequency band above 2.5kHz. Control effectiveness at 10kHz is ±10dB.

20kHz: Provides additional control for the frequency band above 5kHz. Control effectiveness at 20kHz is ±5dB.

VOLUME CONTROL

Adjusts output level to speakers and headphones.

Scale is graduated in dB, and when used in conjunction with the MUTING switch, finer and wider range attenuation can be performed. See additional description on page 6.

AUDIO MUTING SWITCH – 20dB

Depress this switch to attenuate the audio output by 20dB. This convenient feature saves having to disturb the VOLUME control, for example when answering the telephone.

LOUDNESS SWITCH

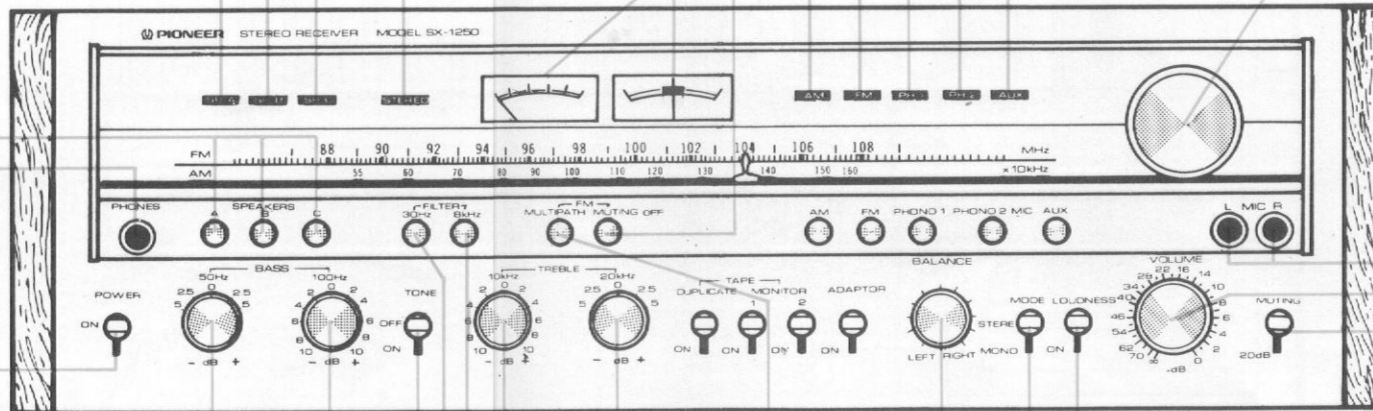
Depress this switch when listening at low volume. The frequency response of the human ear varies according to the listening volume, and the depressed position compensates for hearing response by emphasizing the bass and treble.

MODE SWITCH

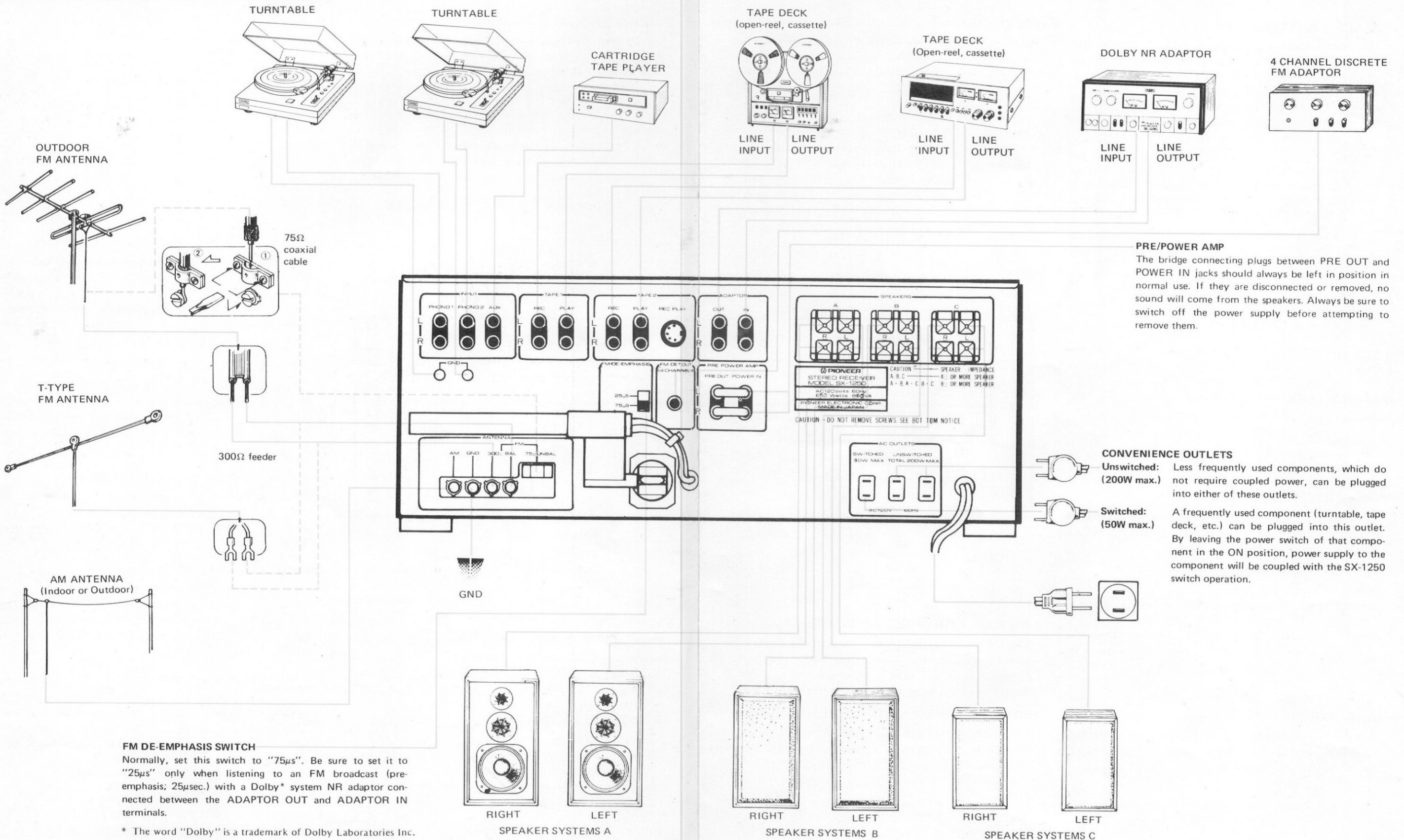
For stereo playback, leave this switch undepressed (or depress to release, if already depressed). When depressed for MONO playback, left and right channel stereo signals will be mixed to produce monophonic sound from both speaker systems.

BALANCE CONTROL

Adjusts the balance between the sound volume from the left and right speaker systems or headphones.



3. CONNECTION DIAGRAM



PRE/POWER AMP
The bridge connecting plugs between PRE OUT and POWER IN jacks should always be left in position in normal use. If they are disconnected or removed, no sound will come from the speakers. Always be sure to switch off the power supply before attempting to remove them.

CONVENIENCE OUTLETS
Unswitched: Less frequently used components, which do not require coupled power, can be plugged into either of these outlets. (200W max.)
Switched: A frequently used component (turntable, tape deck, etc.) can be plugged into this outlet. By leaving the power switch of that component in the ON position, power supply to the component will be coupled with the SX-1250 switch operation. (50W max.)

FM DE-EMPHASIS SWITCH
Normally, set this switch to "75μs". Be sure to set it to "25μs" only when listening to an FM broadcast (pre-emphasis; 25μsec.) with a Dolby* system NR adaptor connected between the ADAPTOR OUT and ADAPTOR IN terminals.

* The word "Dolby" is a trademark of Dolby Laboratories Inc.

4. CIRCUIT DESCRIPTIONS

4.1 TUNER SECTION

FM Front End

The FM front end is composed of a tuning circuit employing a 5-gang variable capacitor, a 2-stage RF amplifier and mixer employing dual gate MOS FETs, and a local oscillator with buffer. An equivalent of a cascode amplifier is produced by AC grounding gate-2 of the dual gate MOS FET, allowing stable RF amplification at high gain.

The output signal of the RF amplifier is applied to gate-1 of the mixer stage MOS FET, while the local oscillator output signal is applied to gate-2. This technique minimizes input power from the local oscillator, resulting in low mutual interference even if the received signal input level is high.

A variation of a Clapp circuit forms the local oscillator. Inclusion of a buffer amplifier between local oscillator and mixer reduces local oscillator load, eliminating distortion of the oscillation waveform. Drawing effect of the local oscillator is also eliminated.

FM IF Section

Four integrated circuits (ICs) and four dual element ceramic filters compose this section. HA1201 (diagram on page 56) is a differential amplifier with a constant current source and functions as a current-limiting limiter. HA1137 (diagram on page 55) contains IF limiter amplifier, quadrature detector, meter drive and muting circuits. The detector circuit contained within this IC is not used in the SX-1250 however, and instead the IF signal is taken from the stage prior to the detector and applied to TA7061AP. This latter IC is a 3-stage differential amplifier (diagram on page 56) and its output goes to the ratio detector for FM detection.

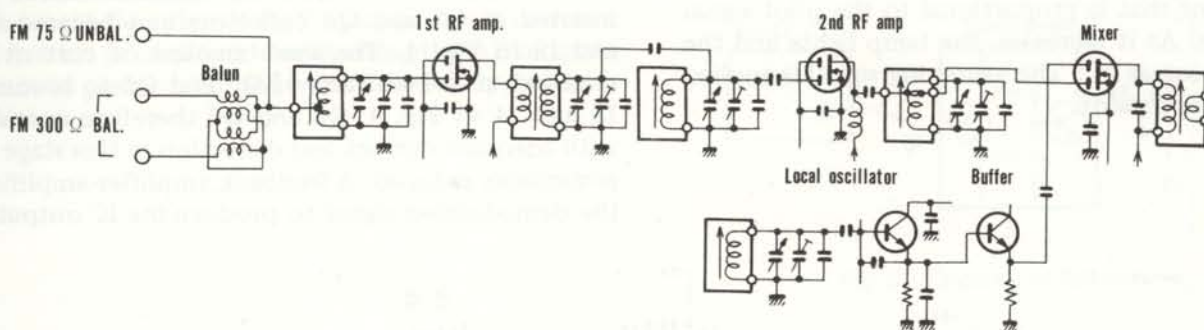


Fig. 1. Circuitry of FM front end

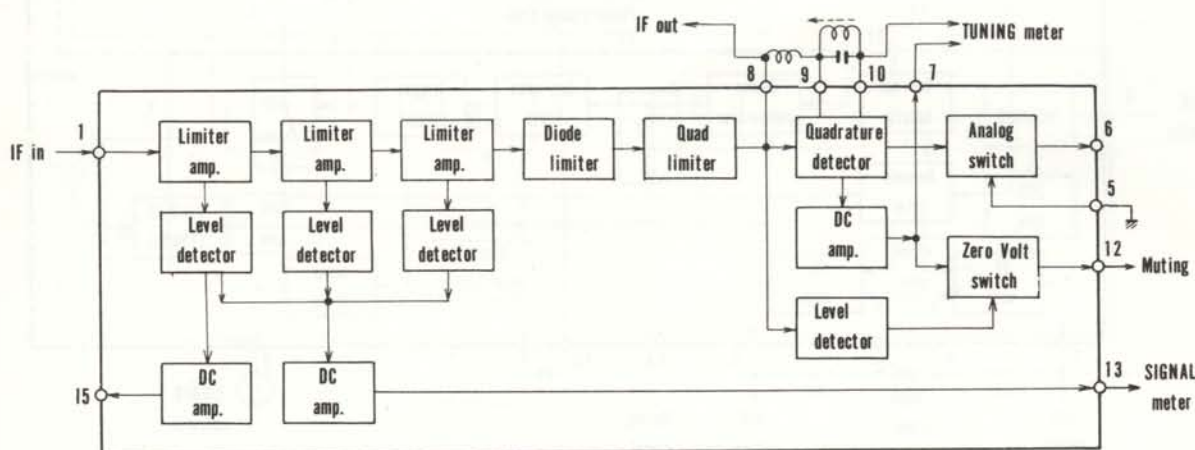


Fig. 2. Block diagram for HA1137

Multiplex Decoder

The multiplex decoder contains three sections and employs an IC (HA1196) with a block diagram as shown in Fig. 3 (see page 55 for circuit).

1. Switching Signal Generator

A PLL (phase locked loop) system is employed. 76kHz is generated by the VCO (voltage controlled oscillator: an oscillator in which frequency is controlled by a voltage) and converted into 38kHz by a frequency divider, then divided again to become 19kHz. This signal and the stereo pilot component (19kHz) of the detected signal are applied to a phase comparator where the difference between them is converted into a voltage. By feedback this voltage is applied to the VCO. And the oscillator signal is locked to the pilot signal. This loop is termed PLL and a 38kHz switching signal synchronized to the pilot signal is obtained and employed as a switching signal.

2. Automatic stereo detector

With the PLL locked to the pilot signal, the pilot signal and a 19kHz signal of the same phase are produced. A voltage is then obtained at the phase comparator that is proportional to the pilot signal amplitude. As it increases, the lamp lights and the switch becomes on. The switching signal is applied to the demodulator.

However, if the FM muting signal is also applied to pin 12, the detector circuit becomes disabled (grounded). Therefore a switching signal to the demodulator is not supplied and mono reproduction is obtained.

3. Demodulator

Two differential amplifiers are employed in a switching circuit (Fig. 4). The composite signal is applied to the base of Q3. Q1 and Q2 are alternately switched ON and OFF by the switching signal. The composite signal amplified at Q3 is demodulated by the switching of Q1 and Q2. Q6 and Q3 are loosely coupled at their emitters by R1, R2 and R3. Q6 is driven in opposite phase to Q3 and its low level composite signal output is demodulated by switching of Q4 and Q5. The demodulated signals in opposite phase are combined at the collectors of Q1 and Q2, cancelling crosstalk. Adequate current flow is required in Q3 and Q6 for low distortion. However, if the base bias voltage is raised, the voltage range available at the collector is reduced and clipping occurs (power supply voltage is limited by IC voltage requirement). For this reason, current from an external source is inserted at Q3 and Q6 collectors and become I1 and I2 in Fig. 4. The same amount of current is removed at the emitters of Q3 and Q6 to become I3 and I4 in Fig. 4. Q3 and Q6 therefore operate with adequate current and distortion in this stage is remarkably reduced. A feedback amplifier amplifies the demodulated signal to produce the IC outputs.

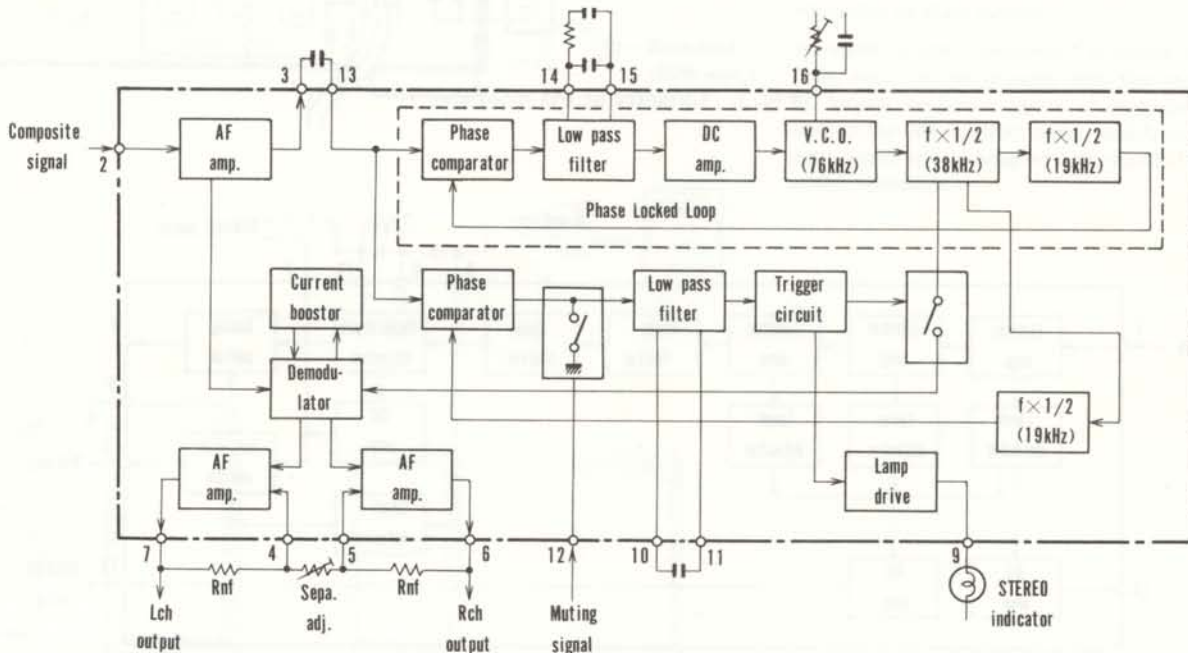


Fig. 3. Block diagram for HA1196

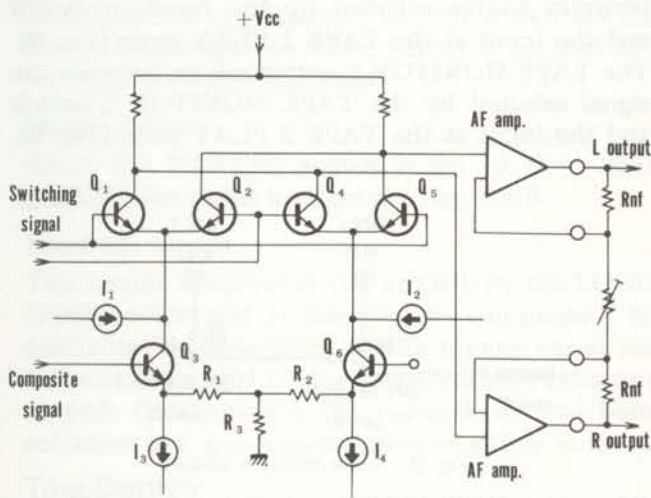


Fig. 4. Basic circuitry of demodulator

FM Muting Circuit (Fig. 5)

DC voltage emerges from pin 12 of IC (HA1137) in the event of more than $\pm 70\text{kHz}$ detuning or low input level (less than $4.9\mu\text{V}$ antenna input conversion). This is employed for shorting the AF output circuit to perform muting by the reed relay.

Multipath Monitor Circuit

When multipath reflections exist in the received signal, the signal is converted into AM and PM (amplitude modulation and phase modulation) forms. Since the amplitude of the actual FM signal is fixed, by converting this AM component into a sound and listening to it, the existence (and amount) of multipath reflection can be determined. Short term level variations (audio frequency) are taken as a signal from HA1137 SIGNAL meter drive terminal (pin 13). By setting the FM MULTIPATH switch to ON during FM reception, this signal becomes connected to the audio amplifier and can be heard as a sound which indicates conditions of multipath reflection.

AM Tuner

The AM tuner employs a 3-gang variable capacitor and an IC (HA1138) with 1-stage of RF and 2-stage of IF amplification. Fig. 6 shows the HA1138 block diagram (see page 55 for circuit).

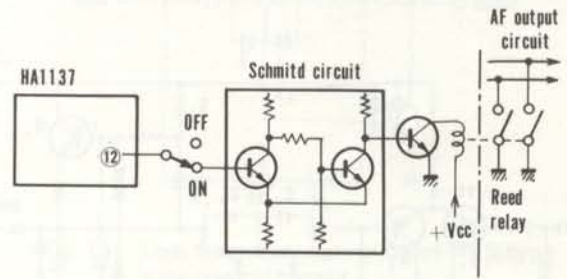


Fig. 5. Circuitry of FM muting

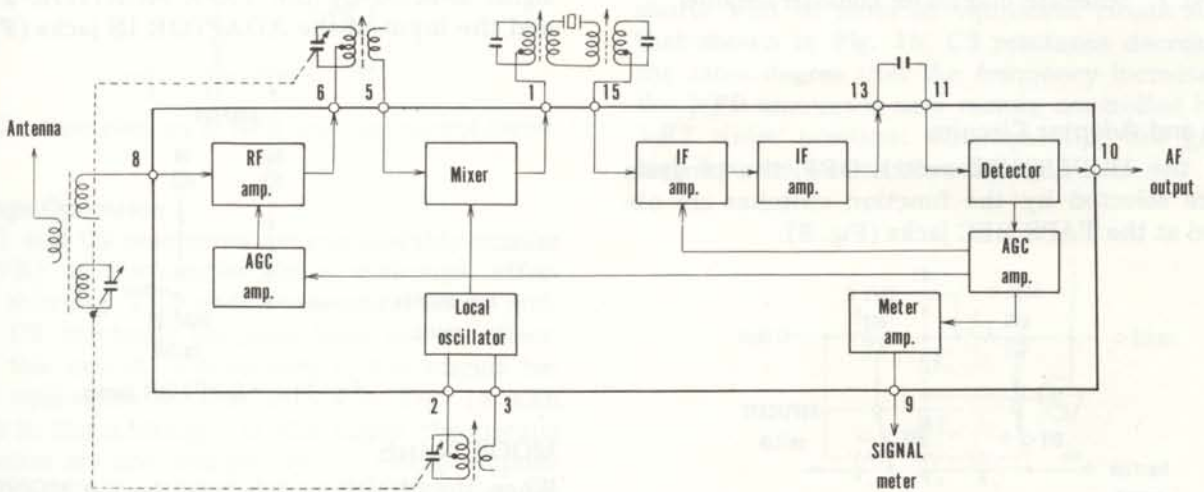


Fig. 6. Block diagram for HA1138

4.2 AUDIO SECTION

Equalizer Amplifier

The equalizer amplifier is shown in Fig. 7. The first stage (Q1 & Q2) is a PNP transistor unbalanced differential amplifier. High voltage gain is provided in the following stage (Q3) by a bootstrap circuit (C1 & R1). The output stage (Q4 & Q5) is a complementary symmetrical SEPP circuit. The high voltage utility factor of the SEPP circuit provides a high maximum output voltage. Dynamic range of the equalizer amplifier is therefore wide and overload input level at 0.1% distortion is 500mV (rms at 1kHz).

Equalizer elements (C2, C3, R2, R3) are polystyrene film capacitors with tolerances within $\pm 1\%$ and metal film resistors with tolerances better than $\pm 1\%$. These lead to a deviation with respect to the RIAA playback standard within $\pm 0.2\text{dB}$. Due to the balanced plus and minus power supply, the input and the output points become essentially 0V, reducing click noise during FUNCTION switch operation.

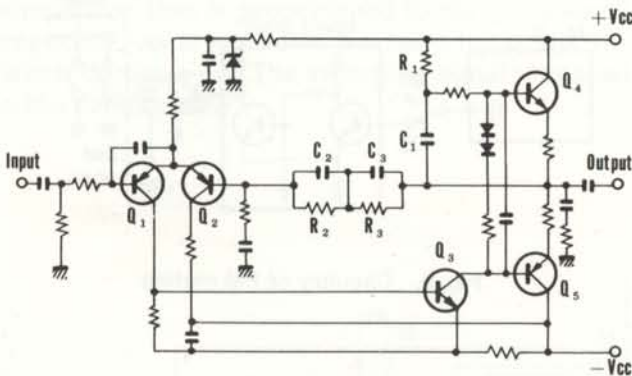


Fig. 7. Schematic diagram for Equalizer amplifier

Tape and Adaptor Circuits

With the DUPLICATE switch OFF, the program source selected by the function switches are obtained at the TAPE REC jacks (Fig. 8).

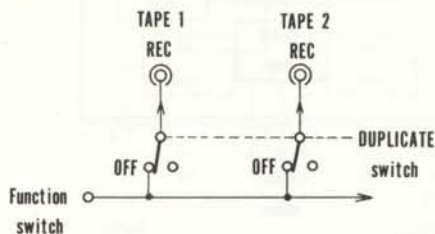


Fig. 8. TAPE REC jacks

The TAPE MONITOR 1 switch selects between the program source selected by the function switch and the input at the TAPE 1 PLAY jacks (Fig. 9). The TAPE MONITOR 2 switch selects between the signal selected by the TAPE MONITOR 1 switch and the input at the TAPE 2 PLAY jacks (Fig. 9).

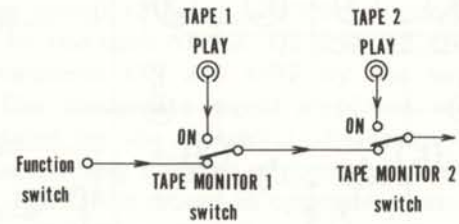


Fig. 9. Tape monitor circuit

When the DUPLICATE switch is set to ON, the TAPE 1 REC jacks are connected to the TAPE 2 PLAY jacks, and the TAPE 2 REC jacks to the TAPE 1 PLAY jacks (Fig. 10).

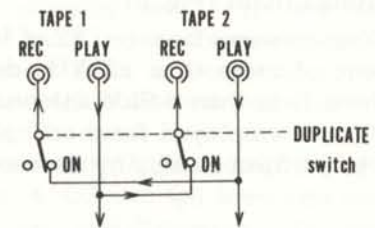


Fig. 10. Tape duplicate circuit

The signal selected by the TAPE MONITOR 2 switch appears at the ADAPTOR OUT jacks (Fig. 11). The ADAPTOR switch selects between the signal selected by the TAPE MONITOR 2 switch and the input at the ADAPTOR IN jacks (Fig. 11).

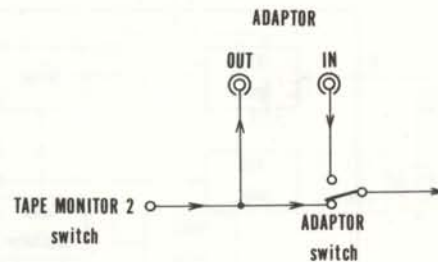


Fig. 11. ADAPTOR jacks

MODE Switch

When the MODE switch is set to the MONO position, the left and right channels are shorted in the stage following the tape and adaptor circuits.

BALANCE Control

A no-loss HB type variable resistor at center position is employed. An SEPP circuit is inserted as a buffer in the following stage.

Muting Circuit

When the MUTING switch is set to the -20dB position, the signal is attenuated by 20dB.

Loudness Circuit

This circuit is operated ON or OFF by the LOUDNESS switch and is intended to compensate for audibility characteristics of the human ear at low volumes. The VOLUME control variable resistor is tapped. Connecting a CR network at this point enhances low and high frequencies at low volumes.

Tone Controls

Twin tone controls are employed with the SX-1250. These consist of ultra-low and ultra-high (sub) controls in addition to the conventional BASS and TREBLE (main) controls.

The signal is amplified to required level by a 2-stage FET and transistor direct coupled amplifier, after which a 2-stage NFB type tone control circuit is provided. The sub controls form the first stage and the main controls form the second stage of this circuit. With NFB type tone controls, C-B feedback is applied to a single transistor amplifier. Frequency response becomes variable by providing selectivity in the feedback circuit. The basic circuit of this stage is shown in Fig. 12.

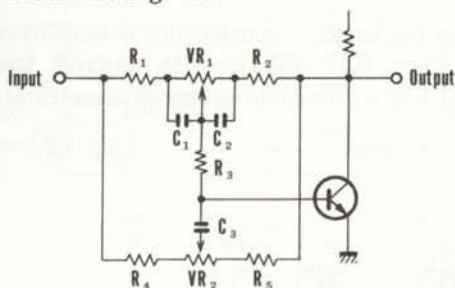


Fig. 12. Basic circuitry of NFB type tone control circuit

Midrange Operation

The C1 and C2 reactances are considerably smaller than VR1 at frequencies above midrange, effectively shorting VR1. At frequencies below midrange, C3 reactance becomes large and in effect, opens the circuit. Consequently, the circuit becomes equivalent to that shown in Fig. 13 with respect to the midrange. In this figure, the circuit parameters are not changed by any change in position of the VR1 and VR2 sliders. The NFB amount is therefore fixed and the circuit gain is also fixed without regard to VR1 and VR2 slider positions.

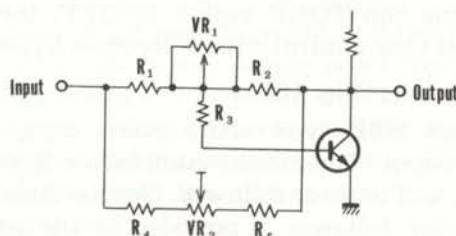


Fig. 13. Midrange operation of NFB type tone control circuit

Low Frequency Operation

The reactance of C1 and C2 increases at low frequency to form a circuit as shown in Fig. 14. This reactance increases in proportion to the frequency declines. Also, the NFB amount varies greatly according to VR1 slider position. The circuit gain at low frequencies can therefore be varied by VR1.

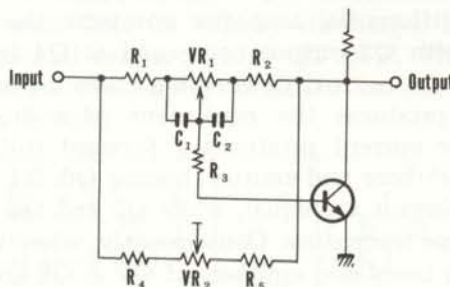


Fig. 14. Low frequency operation of NFB type tone control circuit

High Frequency Operation

The considerably smaller reactance of C1 and C2 at high frequency in comparison with VR1 effectively shorts VR1 to form an equivalent circuit such as that shown in Fig. 15. C3 reactance decreases in the same degree that the frequency increases and the NFB amount is now mainly controlled by the VR2 slider position. Consequently, the gain at high frequencies can be varied by VR2.

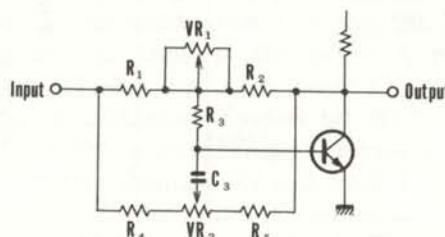


Fig. 15. High frequency operation of NFB type tone control circuit

Tone Defeat Circuit

By setting the TONE switch to OFF, the above described tone control circuit becomes bypassed.

Filter Circuits (Fig. 16)

These are NFB type active filters with -12dB/octave slopes. The circuit combines a 2-stage CR element and emitter follower. Normal function of the emitter follower is provided in the passband and by 100% NFB, gain becomes essentially "1". NFB is cancelled in the area of the cutoff frequency, composing a peak in the frequency response. This leads to improved and sharper CR filter response. In the actual circuit, CR elements for low and high filters both employ the same emitter follower and each can be selected ON-OFF.

Power Amplifier

Fig. 17 shows the power amplifier section. The input stage is composed of Q1 & Q2 differential amplifier, with the input signal applied to Q1. Q3 & Q4 differential amplifier comprise the second stage, with Q3 output composed at Q4 by Q5 & Q6 current mirror. Connecting collector and base of Q5 produces the equivalent of a diode. Q3 collector current produces a forward voltage between Q5 base and emitter, biasing Q6. R1 and R2 in this circuit are equal, while Q5 and Q6 are the same type transistors. Consequently, when voltages between bases and emitters of Q5 & Q6 are equal, current flows in these transistors also become equal. This results in equal current flows in Q3 and Q6. Mutually opposite phase signals drive Q3 and Q4, resulting in mutually opposite phase collector currents. Q4 and Q6 therefore operate as push-pull.

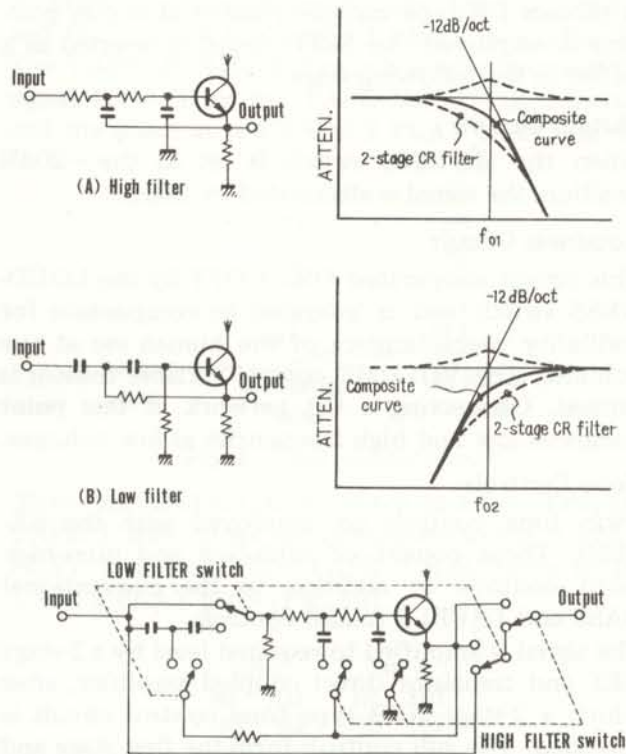


Fig. 16. Basic circuitry of filters

Power stage bias voltage is supplied by the voltage drop across D1, D2 and VR2. VR2 is a semi-fixed resistor for power stage bias adjustment, while D1 and D2 are Varistors for temperature compensation.

A 3-stage Darlington connection is employed in the power stage (Q7-Q14), with output transistors Q11-Q14 in a complementary symmetrical parallel

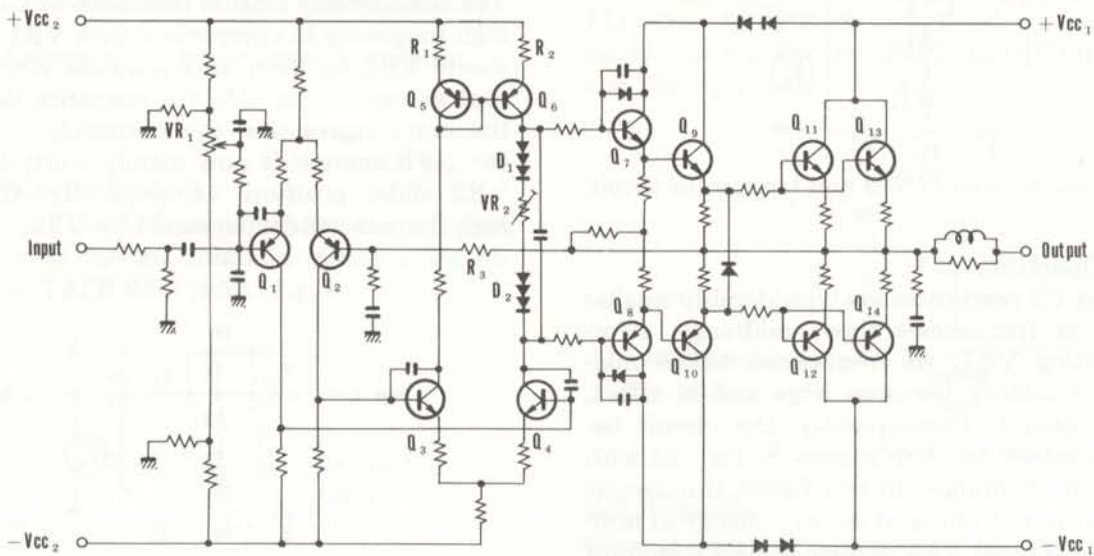


Fig. 17. Schematic diagram for power amplifier

connection. The output center point is at 0V from the balanced plus and minus power supply, while 100% DC NFB is applied to Q2 through R3. Because of this, circuit DC gain becomes 0dB and DC voltage of the output center point is determined by Q1 base voltage. VR1 is a semi-fixed resistor for fine adjustment of the center point voltage to compensate for irregularities in circuit elements.

SPEAKERS Switches

The SX-1250 is provided with 3 sets of speaker terminals (A, B, C). Since the power amplifier can become overloaded if all three sets are used simultaneously, when all 3 SPEAKERS switches are set to ON, the circuit functions as if all switches were OFF and the indicator lamps extinguish.

4.3 PROTECTION CIRCUIT

This circuit protects the power transistors in case of overload, the speakers in case of power amplifier malfunction, and also performs a muting function when the power supply is turned ON or OFF. The protection circuit is composed of three sections (Fig. 18).

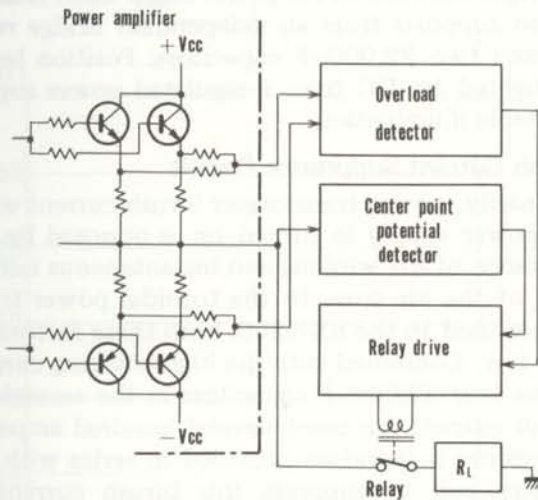


Fig. 18. Block diagram of protection circuit

1. Relay Driver Circuit (Fig. 19)

The relay which connects the output circuits is driven by this circuit. It also performs a muting function to prevent unpleasant noise during ON-OFF operation of the power supply as well as opening the output circuit on command from the detector circuits.

Muting Operation

When the power supply is turned ON, Q6 base is reverse biased through D6 and R19-R21, turning Q6 OFF. Q7 base potential rises as C4 charges through R22 & R23, and Q7 turns ON several seconds later. The collector current of Q7 then

flows through the relay coil, operating the relay to turn on the power amplifier output circuit. The reverse bias of Q6 base from D6 & R19-R21 disappears when the power supply is set from ON to OFF. Q6 remains ON however, due to the residual power supply voltage. C4 very rapidly discharges, Q7 base potential drops and Q7 turns OFF. The relay releases and the power amplifier output circuit turns OFF.

Note:

Q5 is normally OFF due to base bias and does not participate in the muting operation.

Operation by Detector Circuit Command

Command from the detector circuits pass through one of D3, D4 or D5 and are applied in the form of a current flow. Q5 is normally reverse biased through R14, but when a large current flows through one of these diodes, Q5 base potential declines according to the voltage drop at R14. Q5 then becomes ON, Q6 base potential rises and Q6 becomes ON. C4 rapidly discharges and Q7 base potential drops, turning Q7 OFF. The relay releases and the power amplifier output circuit becomes cut off.

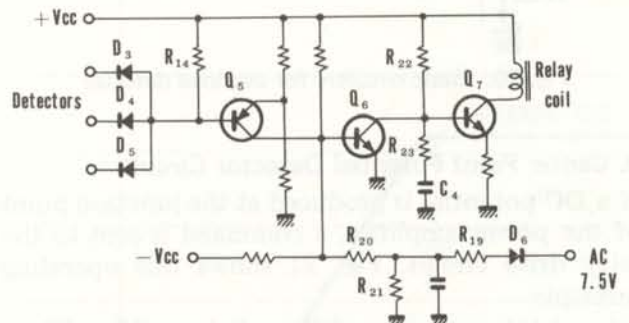


Fig. 19. Schematic diagram of relay driver circuit

2. Overload Detector Circuit

Shorting of the power amplifier load or a load impedance below the specified value causes a command to be sent to the relay drive circuit. This is illustrated in Fig. 20.

With the output stage in class B operation, when Qa is operating in the positive half cycle, Qb becomes cut off and the signal current flows as indicated by the solid arrows in Fig. 20. Point D potential at this time is the point A potential divided by R1 and R3. Also, point C potential is the point A potential divided by RE1 and RL (load). Point D is connected to Q1 base and point C to Q1 emitter through R2 and RE2. When RL is extremely small, the point C potential becomes considerably lower than point D. This potential difference forward biases Q1. Q1 turns ON and current flows in D3.

Qb operates in the negative half cycle and Qa becomes cut off. The signal flow is indicated by the broken line arrows in the center of Fig. 20. Q1 is biased by the potential difference between point C and point E. If RL is extremely small, the point C potential becomes considerably higher than that of point E. Q1 turns ON and current flows in D3.

If large current flows in Qa and Qb, Q1 becomes ON due to the RE1 and RE2 voltage drops, and current flows in D3. C1 prevents faulty operation due to external noise.

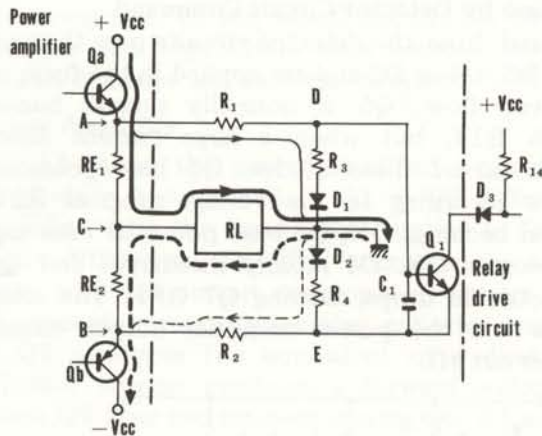


Fig. 20. Basic circuitry for overload detector

3. Center Point Potential Detector Circuit

If a DC potential is produced at the junction point of the power amplifier, a command is sent to the relay drive circuit. Fig. 21 shows this operating principle.

Q3 and Q4 compose a differential amplifier. When the same input is applied to both input terminals (Q3 and Q4 bases), no output is present. However, if there is a difference between the terminal inputs, the difference is amplified and becomes the output between the two collectors. During normal operation, an AC signal only is present at the junction point. As C2 reactance is sufficiently low, the same signal is applied to Q3 and Q4 bases, resulting in an absence of output at the collector sides.

When a DC potential is produced at the junction point, it becomes the input of Q3 only. If the voltage is negative, Q3 collector current declines and at Q4 the collector current increases and the potential drops, causing current to flow through D4.

If the DC voltage is positive, Q3 collector current increases and the potential drops, while at Q4 the collector current decreases and the potential rises. Current therefore flows through D5.

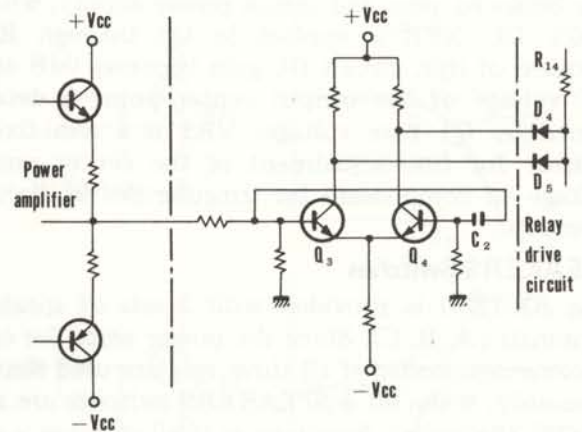


Fig. 21. Basic circuitry for center point potential detector

4.4 POWER SUPPLY CIRCUIT

All power supplied are regulated up to the power amplifier predriver stage. Independent power transformer secondary windings are employed for left and right channels in the power stage. Each channel is also supplied from an independent bridge rectifier and two 22,000 μ F capacitors. Position lamps are lighted by DC from a regulated power supply for stable illumination.

Inrush Current Suppressor Circuit

Ordinarily, power transformer inrush current when the power supply is turned on is opposed by DC resistance of the winding and instantaneous inductance of the air core. In the toroidal power transformer used in the SX-1250, both these factors are very low. Combined with the high charging current of the four 22,000 μ F capacitors in the secondary, inrush current can reach several hundred amperes. A resistor is therefore provided in series with the primary coil to suppress this inrush current to several tens of amperes. This resistor becomes shorted after power transformer excitation.

The inrush suppressor circuit is shown in Fig. 22. S1 is the POWER switch and S2 a relay contact. The Microtemp is a temperature responding fuse. S2 is open before power is turned on, connecting the power transformer primary coil in series with R1 and the Microtemp. After power has been turned on, the relay operates when DC current is obtained from the rectifier, closing S2. If S2 fails to close, due to power supply or relay malfunction, R1 heating opens the Microtemp (109°C operating temperature), thus opening the primary circuit.

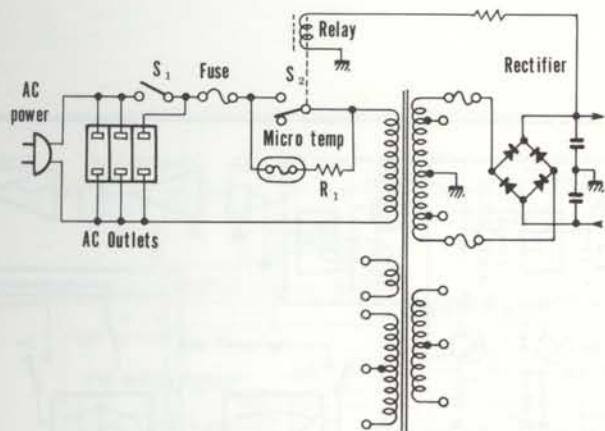
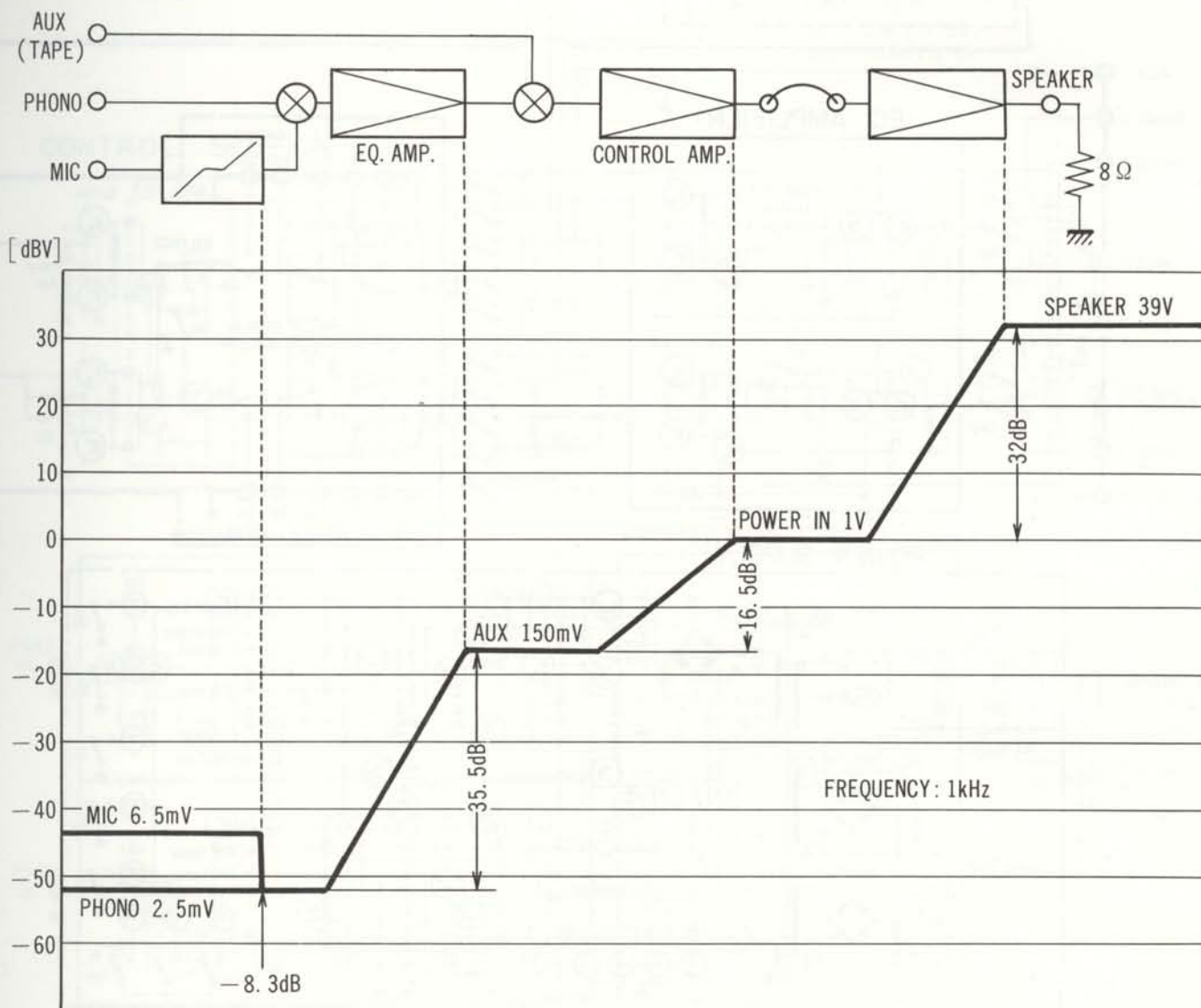
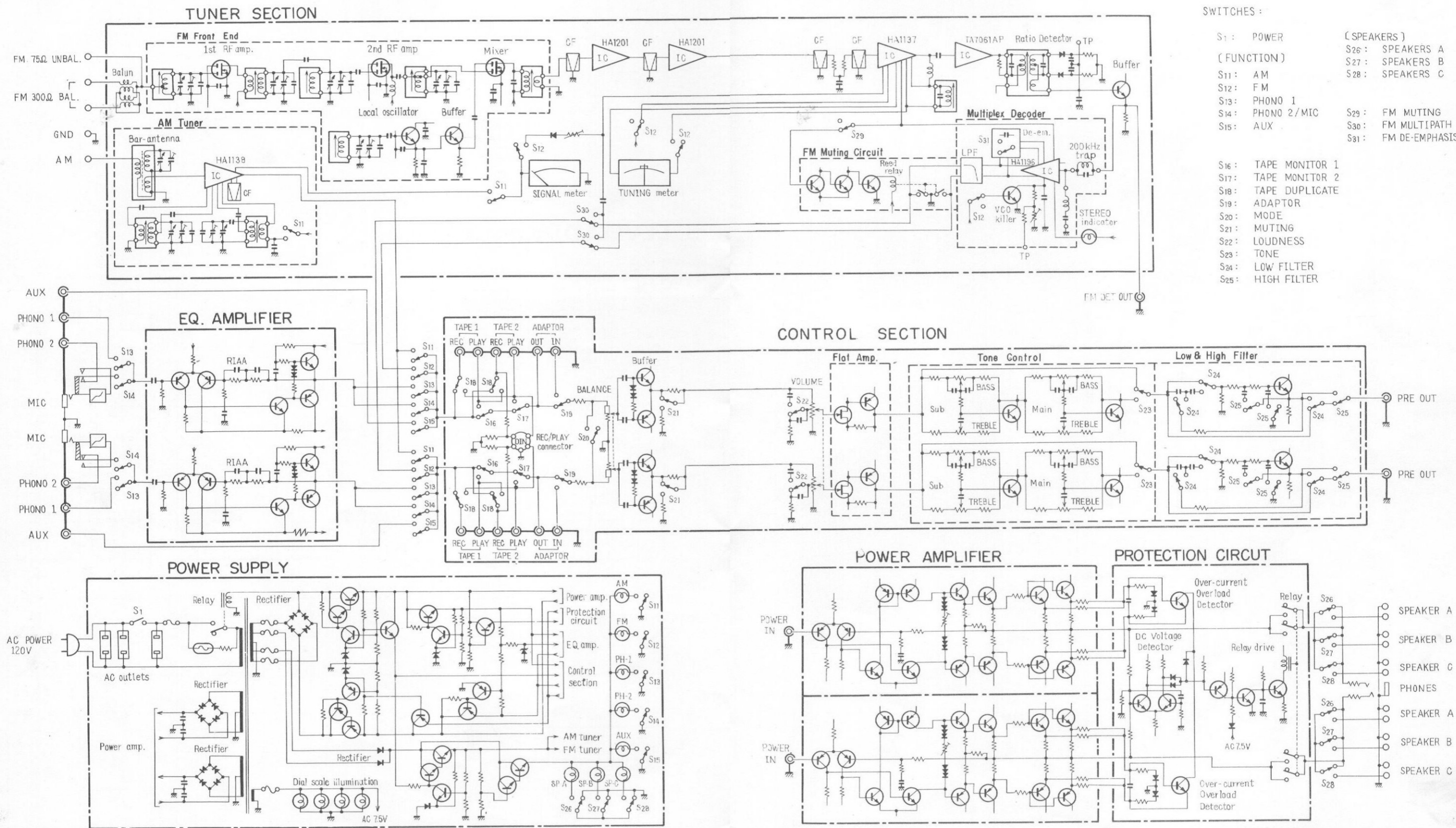


Fig. 22. Basic circuitry for inrush current suppressor

5. LEVEL DIAGRAM



6. BLOCK DIAGRAM



7. DISASSEMBLY

Top Plate

Remove the six screws (A) to detach the top plate.

Wooden Cover

Remove the two screws (B) on each side of the wooden cover.

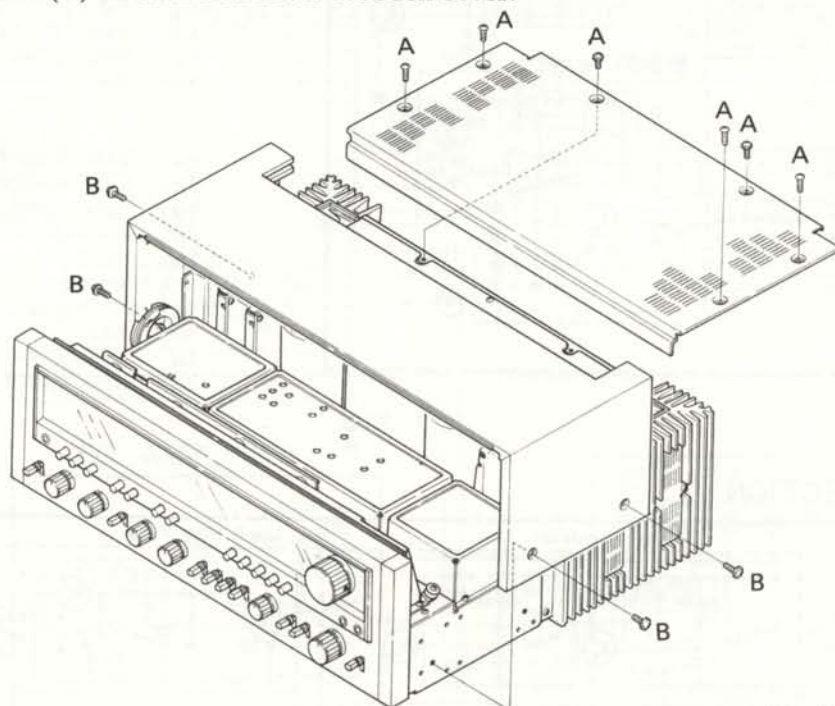


Fig. 25

Bottom Plate

Remove the fifteen screws to detach the bottom plate.

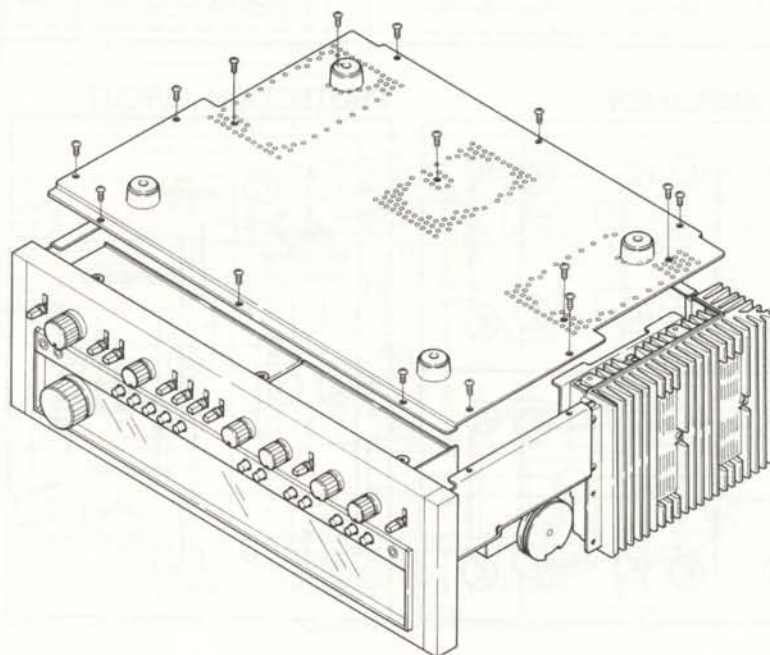


Fig. 26

Front Panel

Loosen the setscrews of TUNING and VOLUME knobs with a hexagonal wrench. Remove all the knobs by pulling. Remove the two screws from the top edge of the front panel. Remove the three nuts from the sub-tone and volume control shafts.

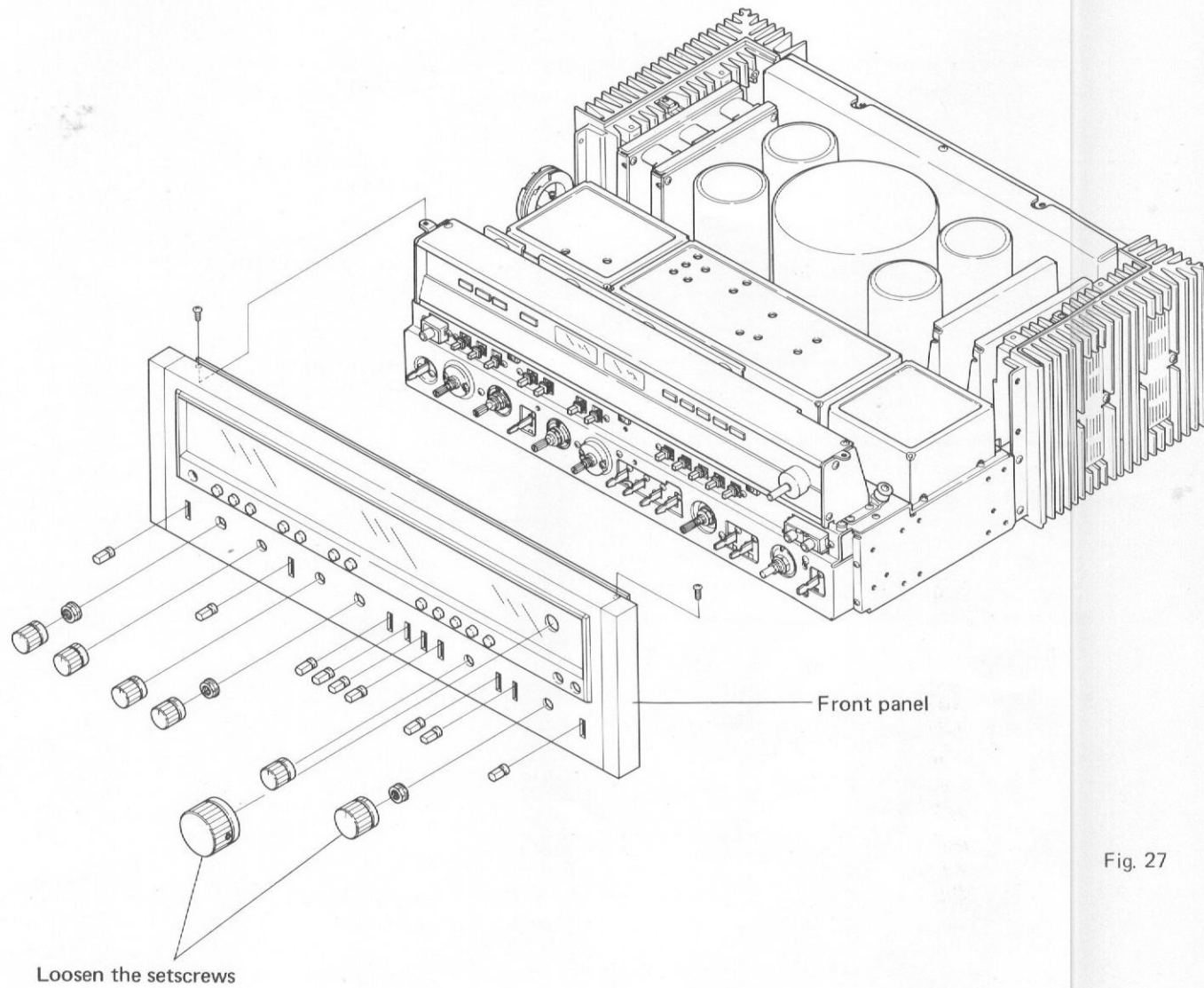
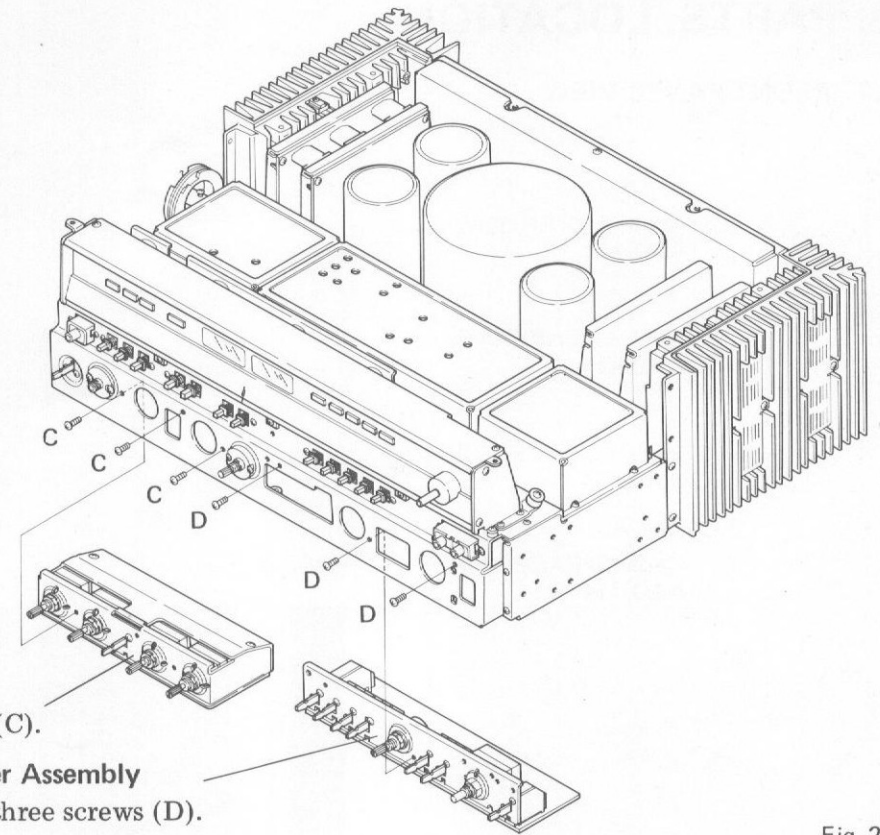


Fig. 27



Tone Amplifier Assembly

Remove the three screws (C).

Flat Amplifier Assembly

Remove the three screws (D).

Fig. 28

Speakers Switch Assembly

Remove the four screws (E).

Filter Amplifier Assembly

Remove the two screws (F).

Function Switch Assembly

Remove the two screws (G).

Microphone Jack Assembly

Remove the two screws (H).

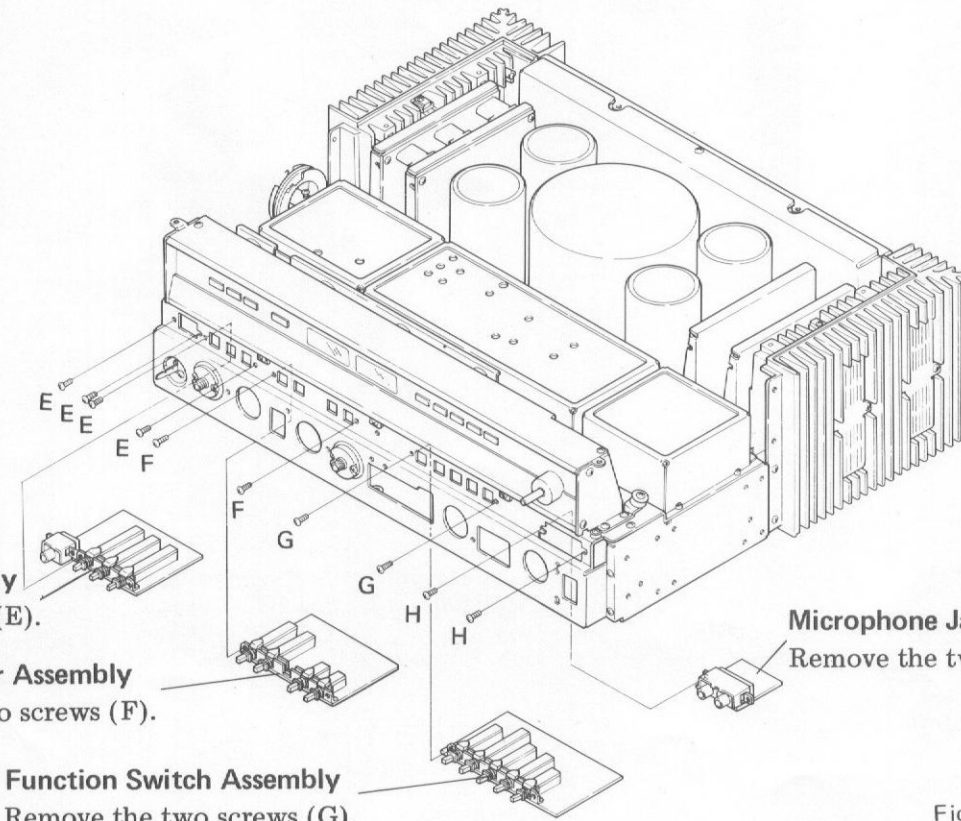
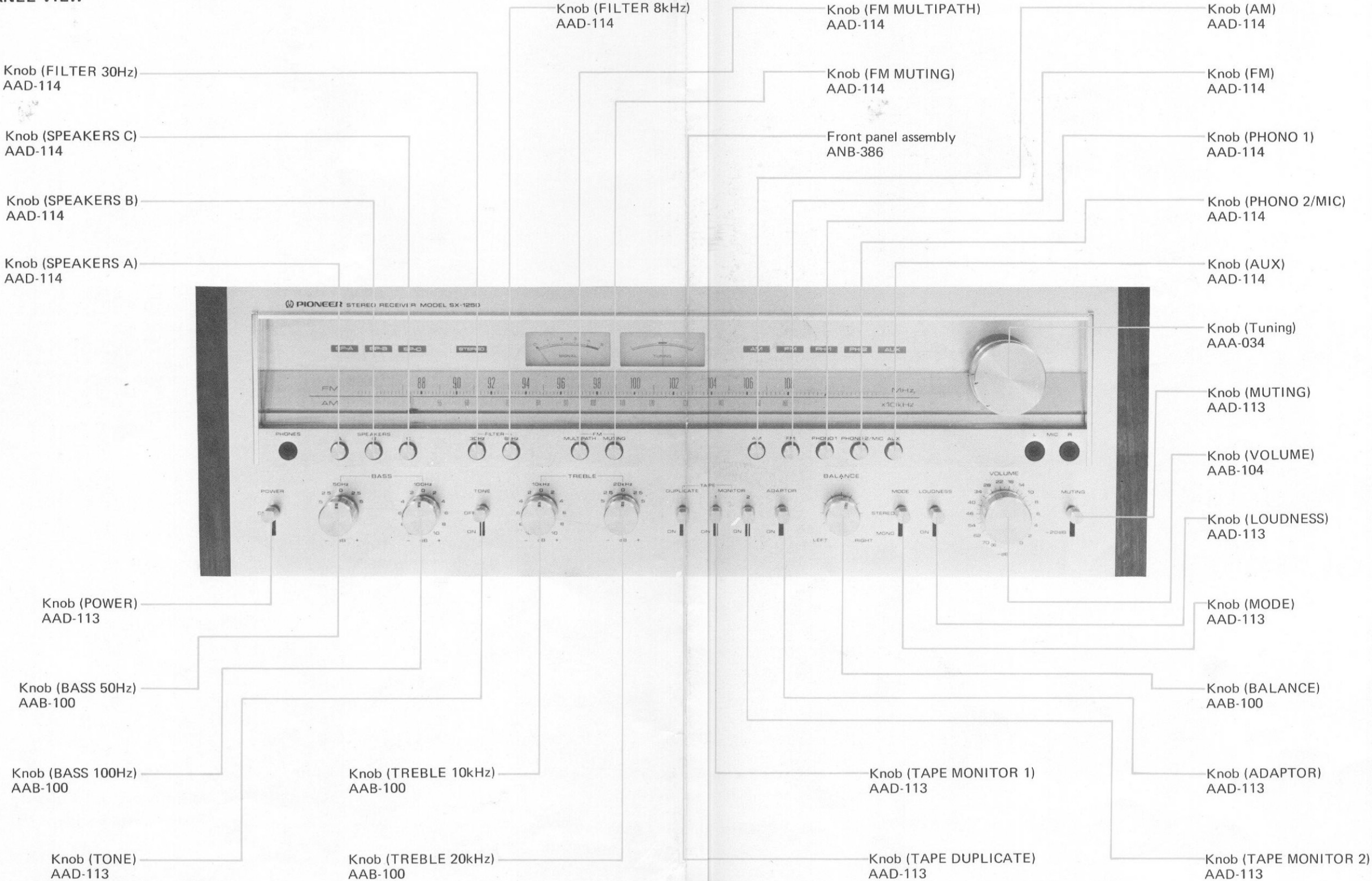


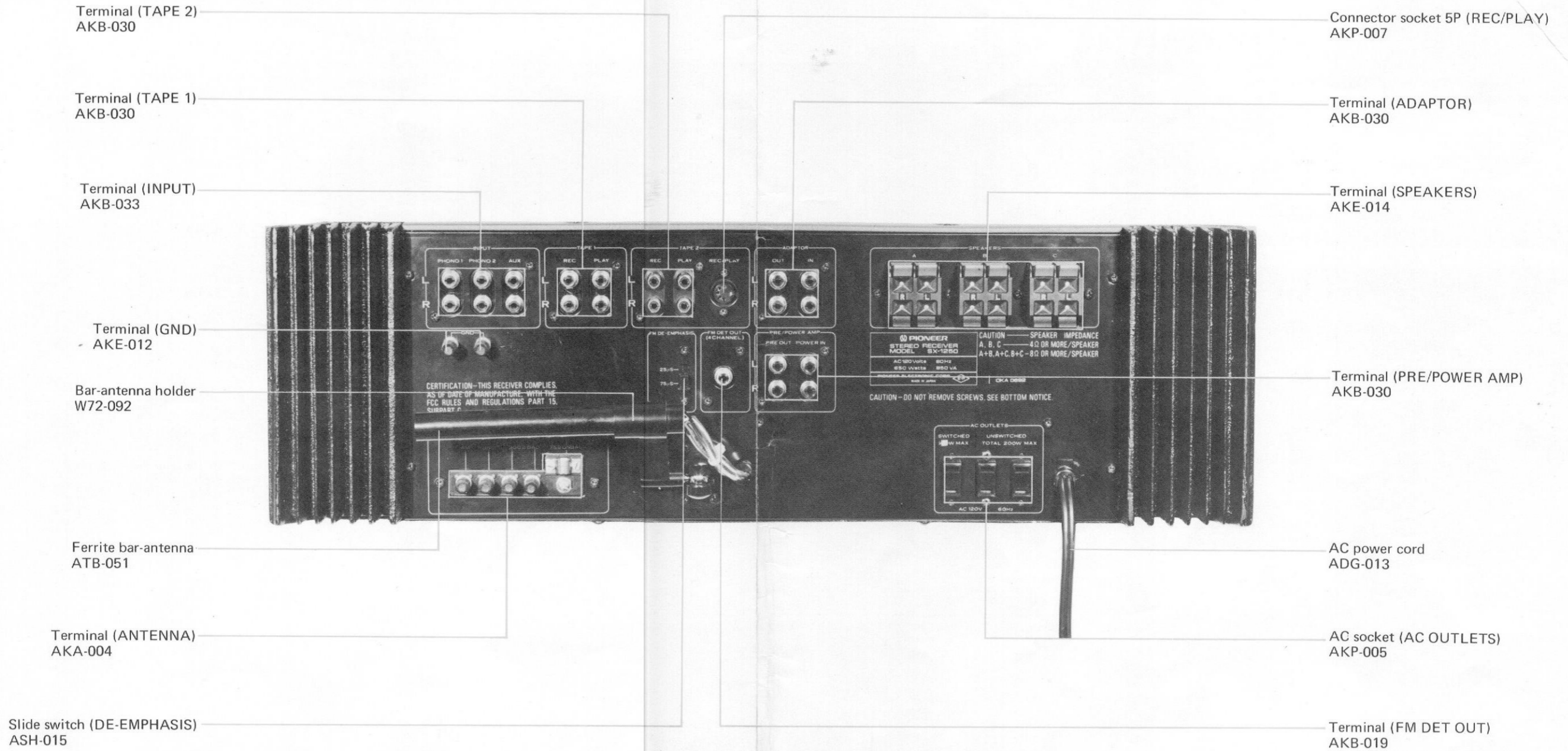
Fig. 29

8. PARTS LOCATION

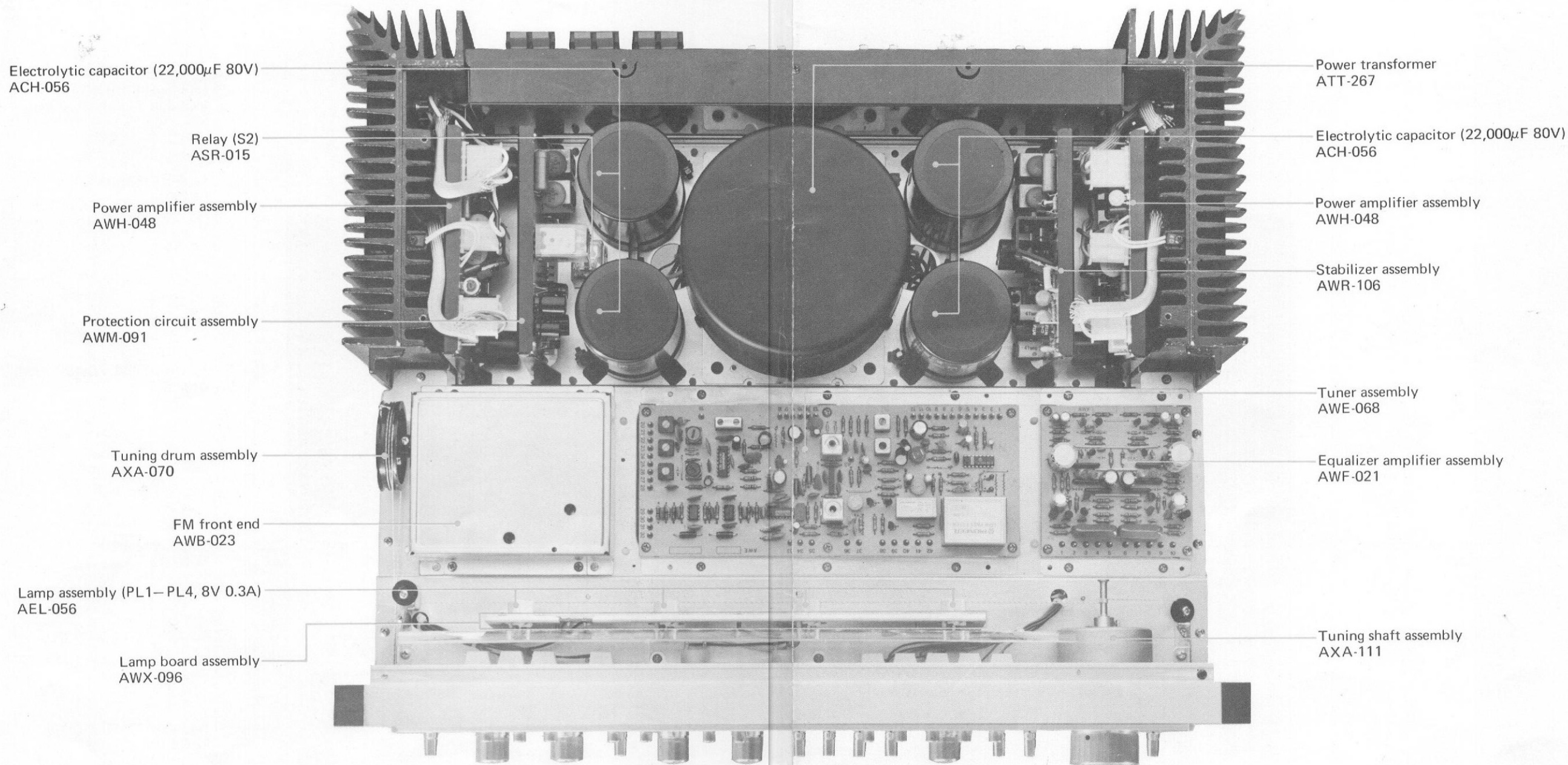
8.1 FRONT PANEL VIEW



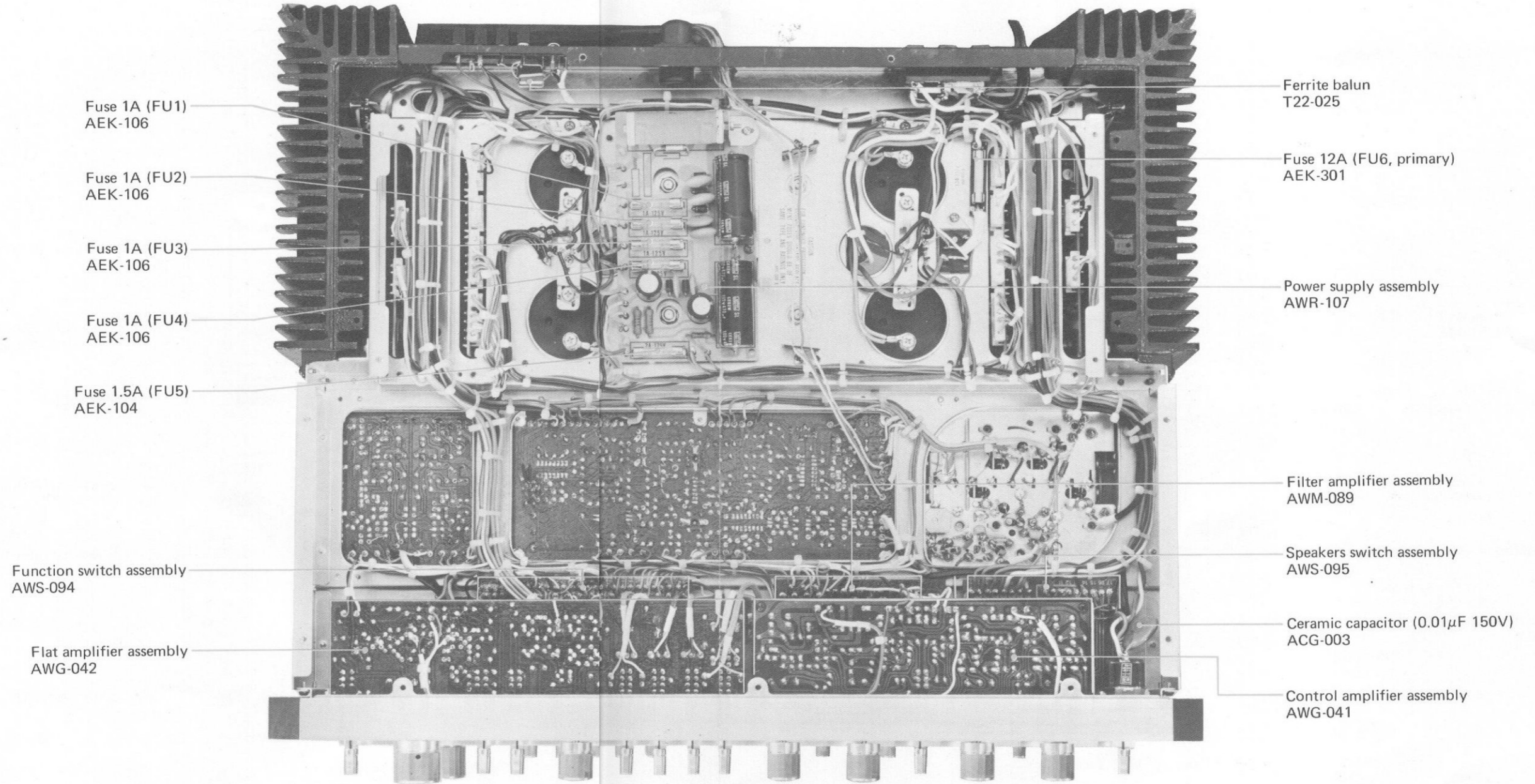
8.2 REAR PANEL VIEW



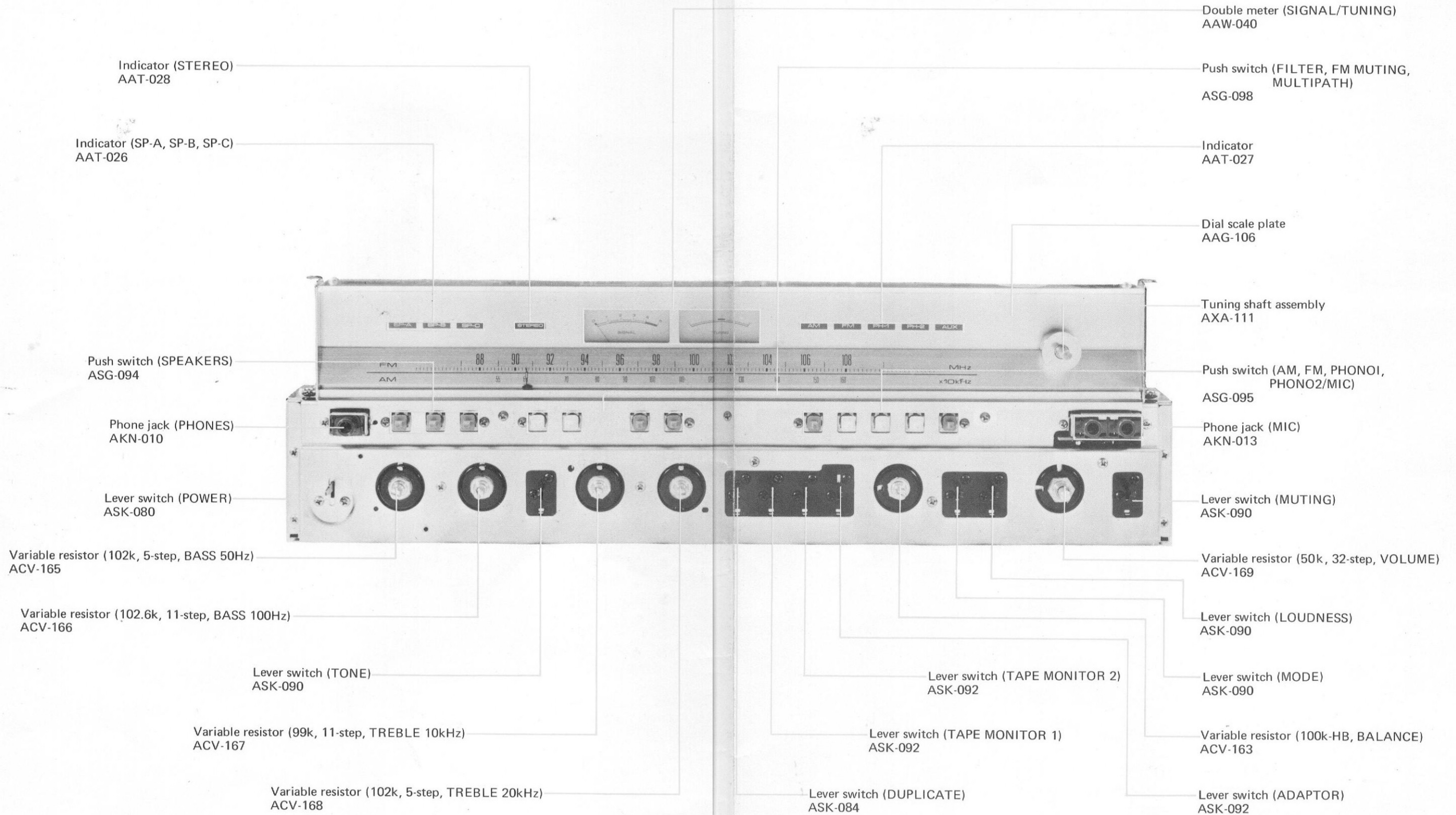
8.3 TOP VIEW



8.4 BOTTOM VIEW



8.5 FRONT VIEW



9. ADJUSTMENTS

9.1 AM TUNER

1. Set function switch to AM.
2. Connect AM signal generator through 1k-ohm resistor to AM antenna terminal.
3. Set DUPLICATE switch to OFF and connect an AC voltmeter to TAPE 1 REC jacks.
4. Set AM SG for 400Hz 30% modulation 100dB output.
5. Set SX-1250 dial indication and AM SG frequency for 600kHz.
6. Adjust T3 core for maximum reading on AC voltmeter.
7. Set SX-1250 dial indication and AM SG frequency for 1,400kHz.
8. Adjust TC1 for maximum reading on AC voltmeter.
9. Set AM SG for 30dB output.
10. Set SX-1250 dial indication and AM SG frequency for 600kHz.
11. Adjust T3, T4 and bar antenna core for maximum reading on AC voltmeter.
12. Set SX-1250 dial indication and AM SG frequency for 1,400kHz.
13. Adjust TC1, TC2 and TC3 for maximum reading on AC voltmeter.
14. Repeat steps 10~13 to eliminate variations in AC voltmeter readings.

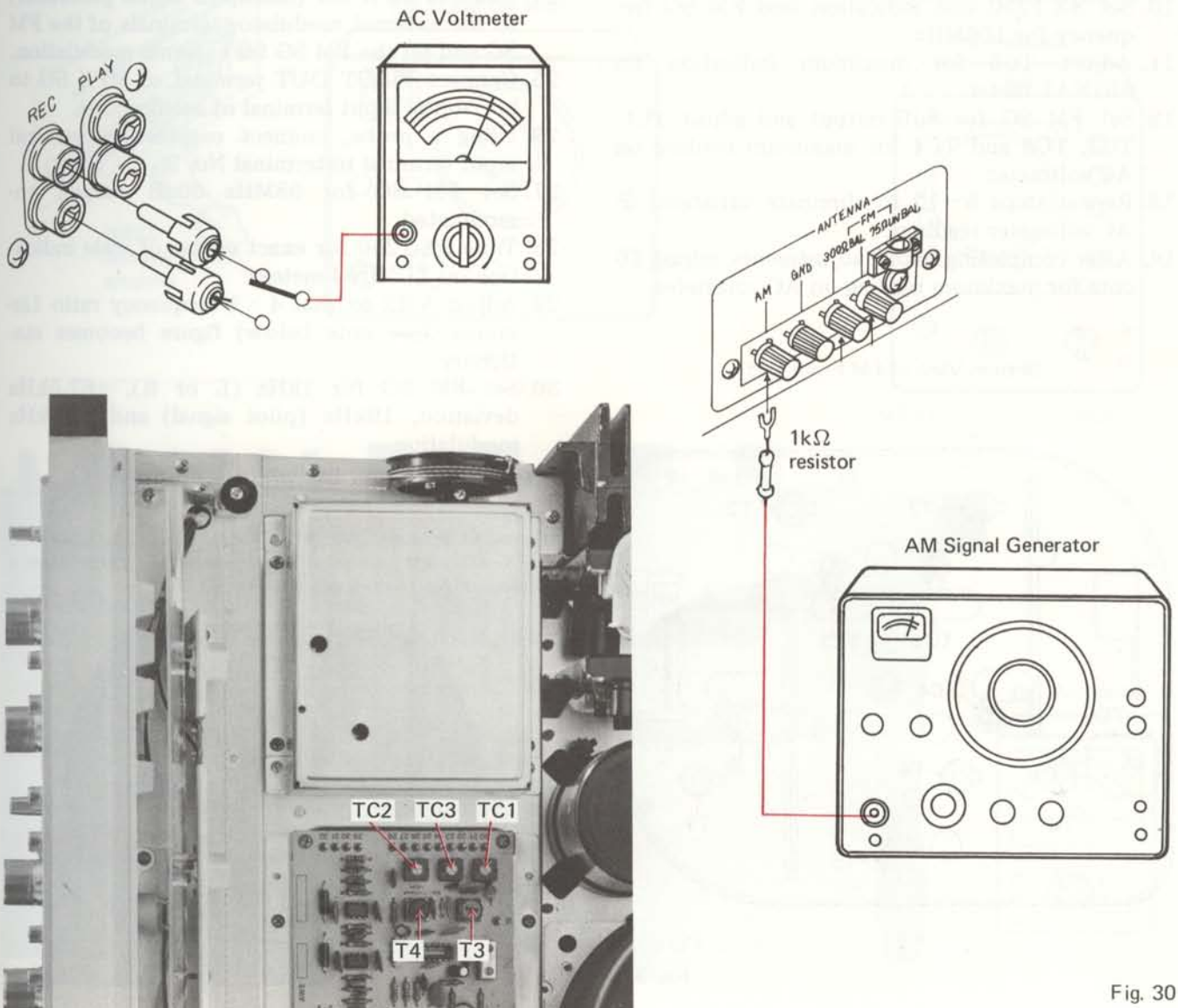


Fig. 30

9.2 FM TUNER

FM Front End

1. Set function switch to FM.
2. Set FM MUTING switch to OFF.
3. Connect FM signal generator through 300-ohm dummy load to 300 ohm FM antenna terminals.
4. Set DUPLICATE switch to OFF and connect AC voltmeter to TAPE 1 REC jacks.
5. Set FM SG for 100dB output at 400Hz and 100% modulation.
6. Set SX-1250 dial indication and FM SG frequency for 87.4MHz.
7. Adjust T5 core for maximum indication on SIGNAL meter.
8. Set FM SG for 8dB output and adjust cores of T1, T2, T3 and T4 for maximum reading on AC voltmeter.
9. Set FM SG for 100dB output.
10. Set SX-1250 dial indication and FM SG frequency for 106MHz.
11. Adjust TC5 for maximum indication on SIGNAL meter.
12. Set FM SG for 8dB output and adjust TC1, TC2, TC3 and TC4 for maximum reading on AC voltmeter.
13. Repeat steps 5~12 to eliminate variations in AC voltmeter readings.
14. After completing above adjustments, adjust T6 core for maximum reading on AC voltmeter.

Bottom View of FM Front End

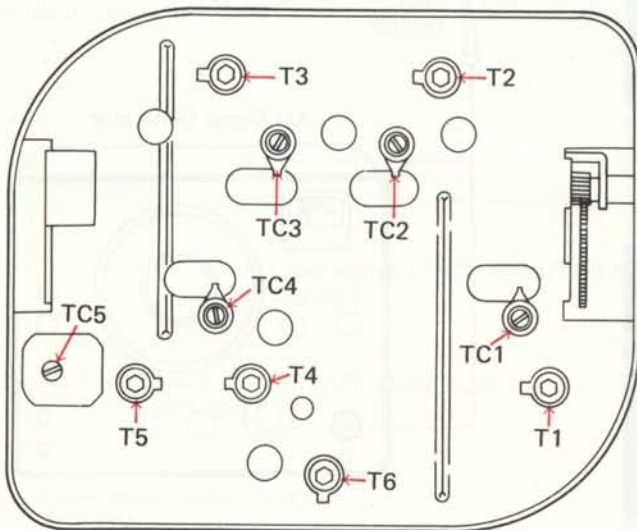


Fig. 31

Tuner Assembly

15. Connect DC voltmeter to terminal No. 43.
16. Turn VR1 and VR3 fully counter-clockwise.
17. Detune SX-1250 to where only noise is received and adjust T1 core for center of scale indication on TUNING meter.
18. Set FM SG for 98MHz 60dB output.
19. Tune SX-1250 for exact center of scale indication on TUNING meter.
20. Adjust T2 upper core for 0V ($\pm 10\text{mV}$) between terminal No. 43 and ground.
21. Adjust T2 lower core for minimum distortion.
22. Repeat steps 20—21 several times.
23. Set FM SG for 100dB output and adjust VR1 so that SIGNAL meter indicates 4.7 on the scale.

Multiplex Decoder

24. Connect MPX SG (multiplex signal generator) to the external modulator terminals of the FM SG and set the FM SG for external modulation.
25. Connect PILOT OUT terminal of MPX SG to horizontal input terminal of oscilloscope.
26. Using a probe, connect oscilloscope vertical input terminal to terminal No. 9.
27. Set FM SG for 98MHz 60dB output unmodulated.
28. Tune SX-1250 for exact center of scale indication on TUNING meter.
29. Adjust VR2 so that 4 : 1 frequency ratio Lissajous' (see note below) figure becomes stationary.
30. Set FM SG for 1kHz (L or R), $\pm 67.5\text{kHz}$ deviation, 19kHz (pilot signal) and $\pm 7.5\text{kHz}$ modulation.
31. Adjust VR3 for minimum L-R crosstalk.

Note:

Signal at terminal No. 9 is 76kHz sawtooth wave and MPX SG pilot out is a 19kHz sinewave. These form a Lissajous' figure such as shown in Fig. 32.

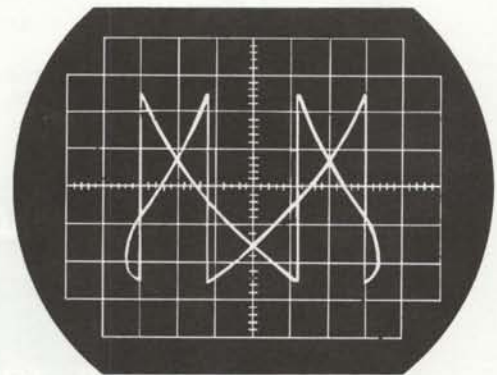


Fig. 32

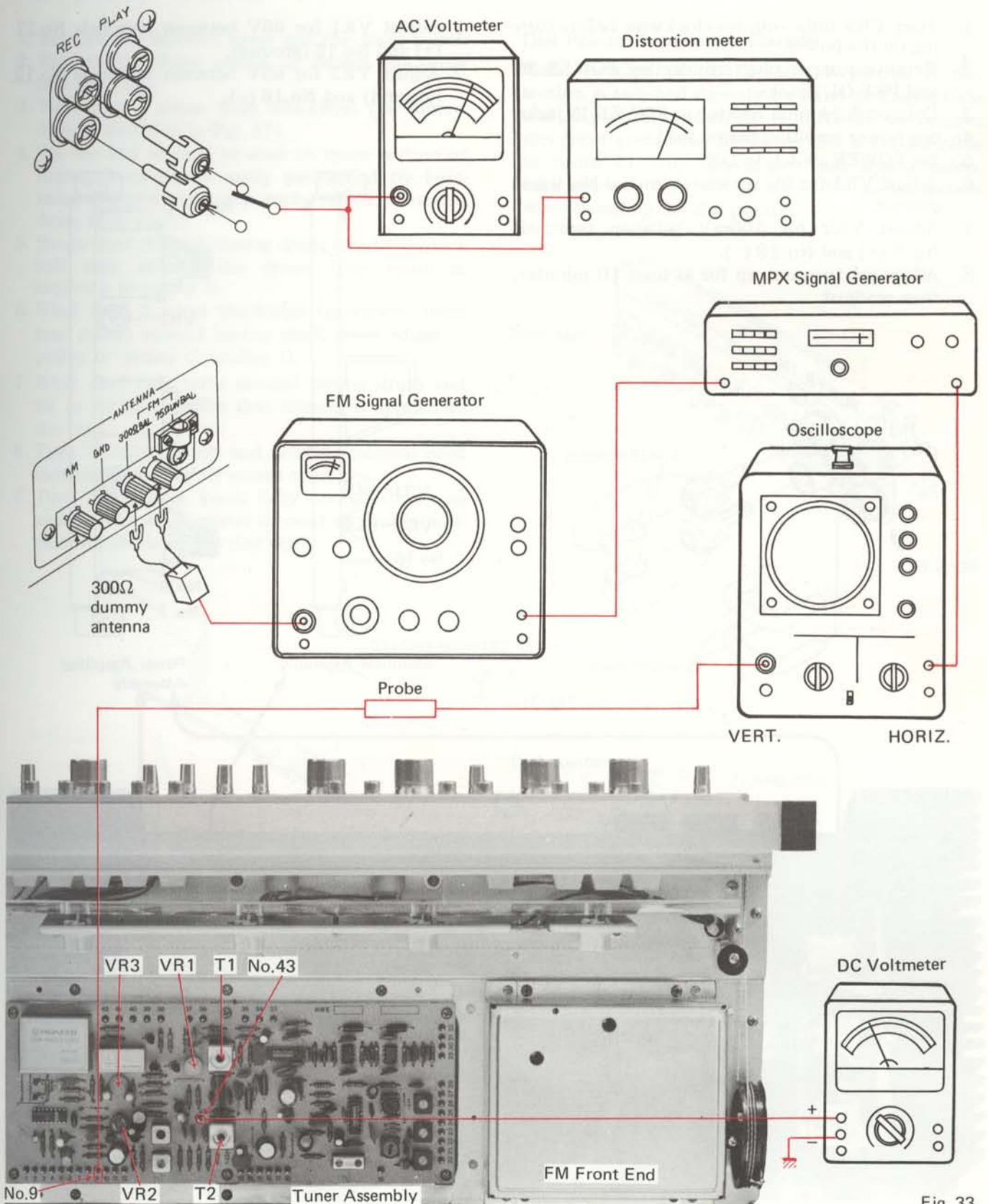


Fig. 33

9.3 POWER AMPLIFIER

1. Turn VR2 fully counter-clockwise before turning on the power.
2. Remove jumper plugs connecting POWER IN and PRE OUT jacks.
3. Connect 5.1 k-ohm resistor to POWER IN jacks.
4. Set power amplifier for no load.
5. Set POWER switch to ON.
6. Adjust VR1 for 0V between terminal No. 9 and ground.
7. Adjust VR2 for 100mV between terminals No. 7 (+) and No. 19 (-).
8. Allow set to warm up for at least 10 minutes, then readjust.

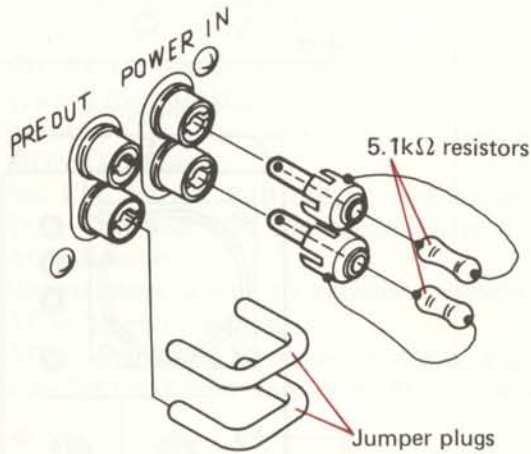


Fig. 34

9.4 STABILIZER

1. Adjust VR1 for 65V between terminals No.17 (+) and No.12 (ground).
2. Adjust VR2 for 65V between terminals No.12 (ground) and No.16 (-).

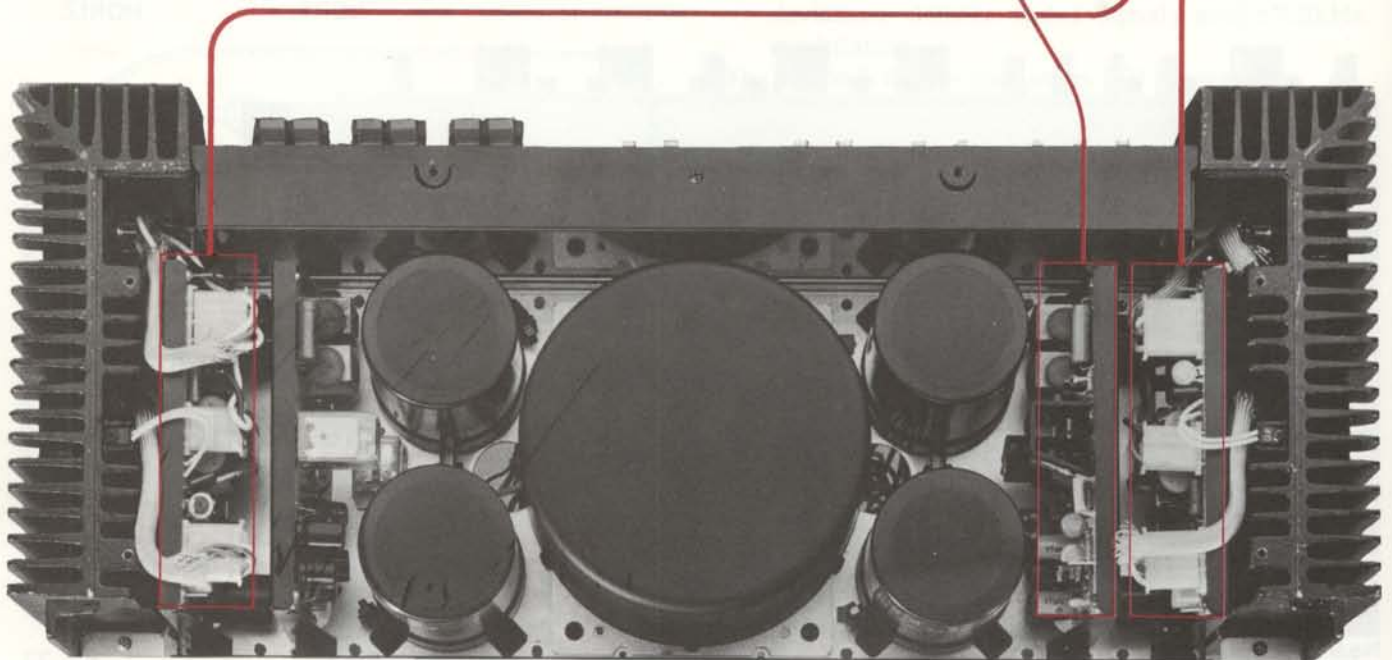
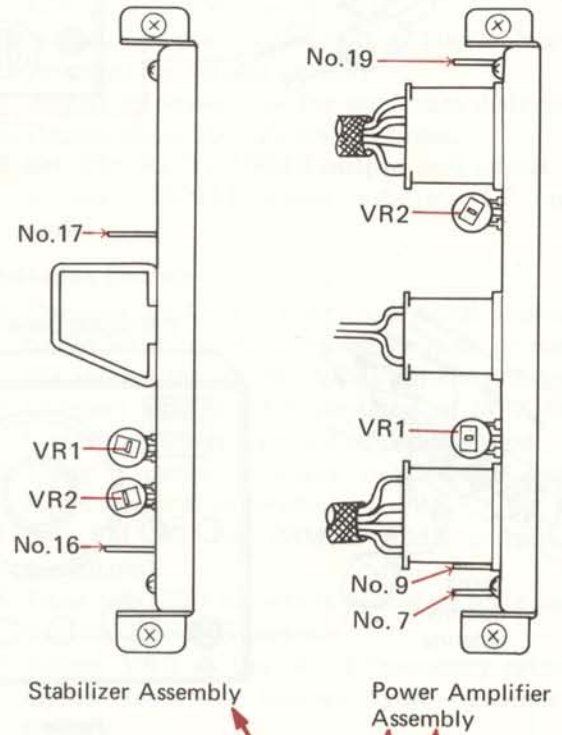


Fig. 35

10. DIAL CORD STRINGING

1. Remove the wooden cover and the front panel.
2. Remove the three screws to detach the blind sash (Fig. 36).
3. Turn tuning drum fully clockwise (as viewed from X direction in Fig. 37).
4. Tie one end of cord to stud on inner section of tuning drum (more easily performed by loosening setscrew and temporarily removing tuning drum from shaft).
5. Route cord through tuning drum cutout, make a half turn around the drum, then route in sequence to pulley A.
6. Wind cord 3 turns clockwise (as viewed from rear panel) around tuning shaft, then route to pulley B—pulley C—pulley D.
7. Wind cord two turns around tuning drum and tie to spring hook so that tension is applied to the cord.
8. Turn TUNING knob and confirm normal cord motion, then trim off excess cord.
9. Turn the tuning knob fully counterclockwise and fix the dial pointer to cord so that it indicates 87.4MHz on the dial scale.

Dial Pointer Installation Caution

Metal portion of dial pointer is plated. If this section is touched directly by hand or fingerprints and other impurities, it is difficult to remove dirt from aventurine finish. As this is not desirable in terms of both appearance and anticorrosion, take extreme care not to touch the metal section when handling the dial pointer.

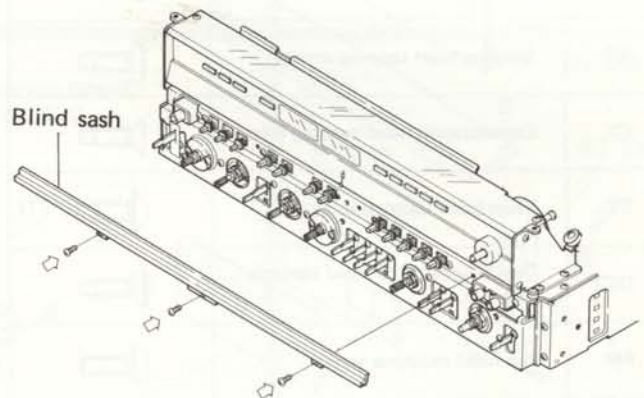


Fig. 36

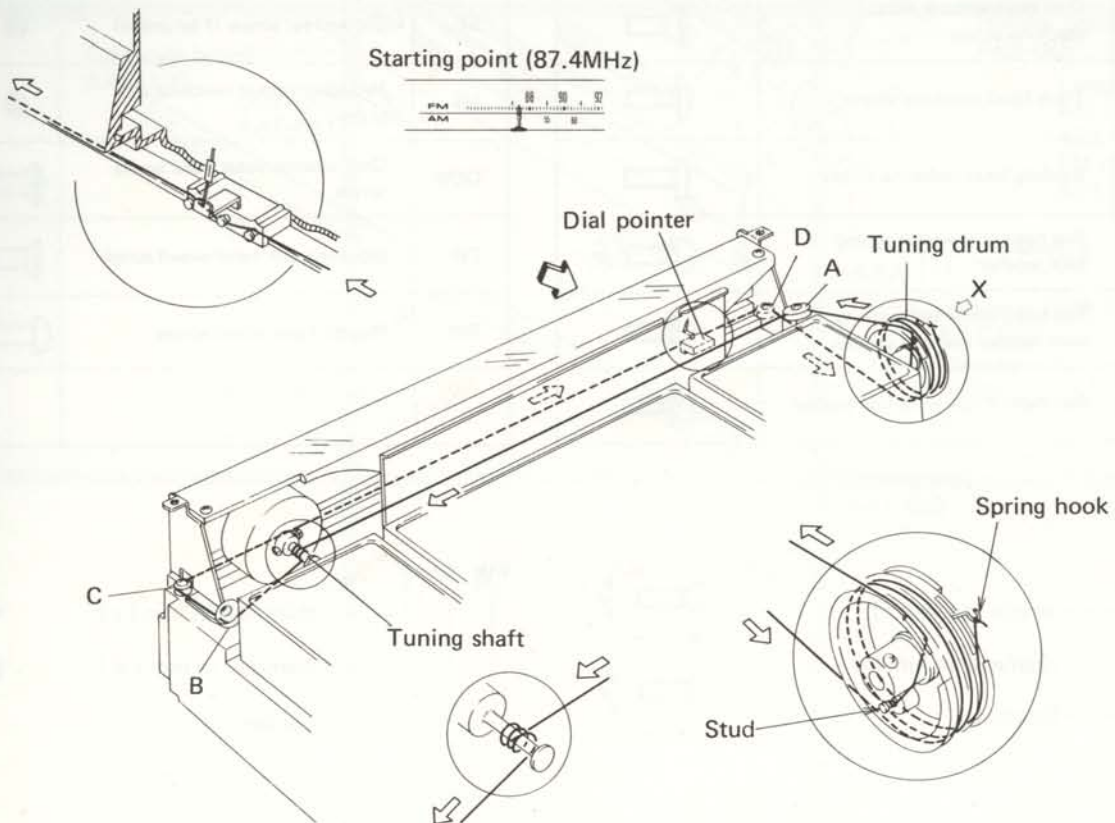
















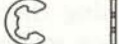


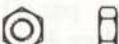

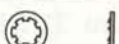
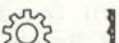


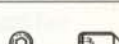

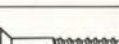
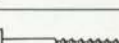
Fig. 37

11. EXPLODED VIEWS

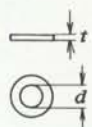
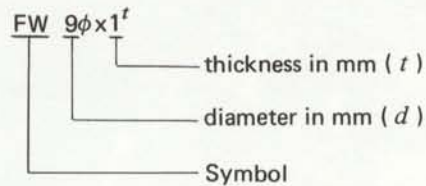
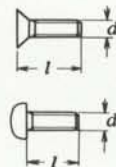
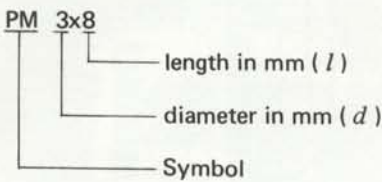
NOMENCLATURE OF SCREWS, WASHERS AND NUTS

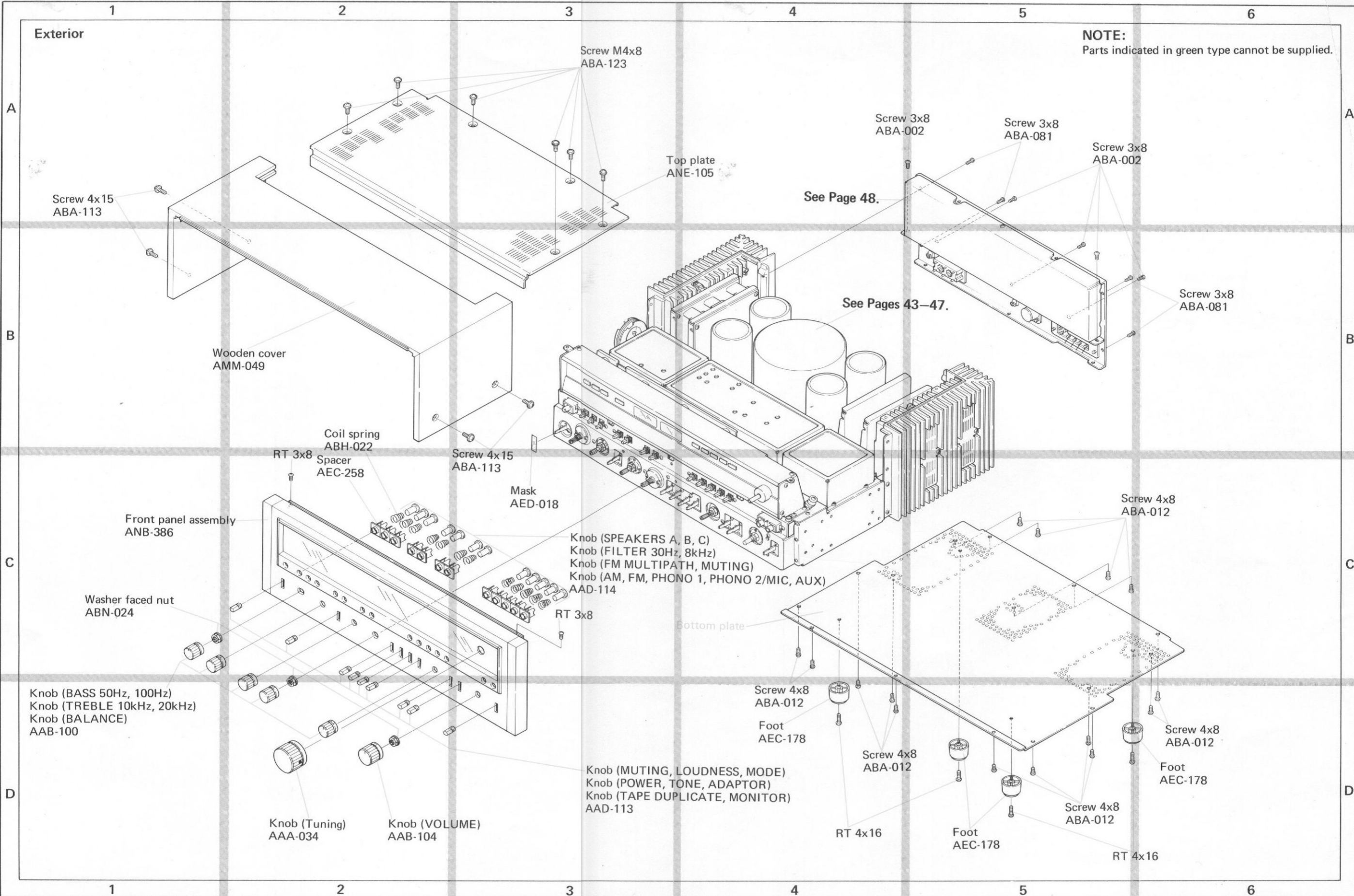
The following symbols stand for screws, washers and nuts as shown in exploded view.

Symbol	Description	Shape
RT	Brazier head tapping screw	
PT	Pan head tapping screw	
BT	Binding head tapping screw	
CT	Countersunk head tapping screw	
TT	Truss head tapping screw	
OCT	Oval countersunk head tapping screw	
PM	Pan head machine screw	
CM	Countersunk head machine screw	
OCM	Oval countersunk head machine screw	
TM	Truss head machine screw	
BM	Binding head machine screw	
PSA	Pan head screw with spring lock washer	
PSB	Pan head screw with spring lock washer and flat washer	
PSF	Pan head screw with flat washer	

Symbol	Description	Shape
EW	E type washer	
FW	Flat washer	
SW	Spring lock washer	
N	Nut	
WN	Washer faced nut	
ITW	Internal toothed lock washer	
OTW	Outernal toothed lock washer	
SC	Slotted set screw (Cone point)	
SF	Slotted set screw (Flat point)	
HS	Hexagon socket headless set screw	
OCW	Oval countersunk head wood screw	
CW	Countersunk head wood screw	
RW	Round head wood screw	

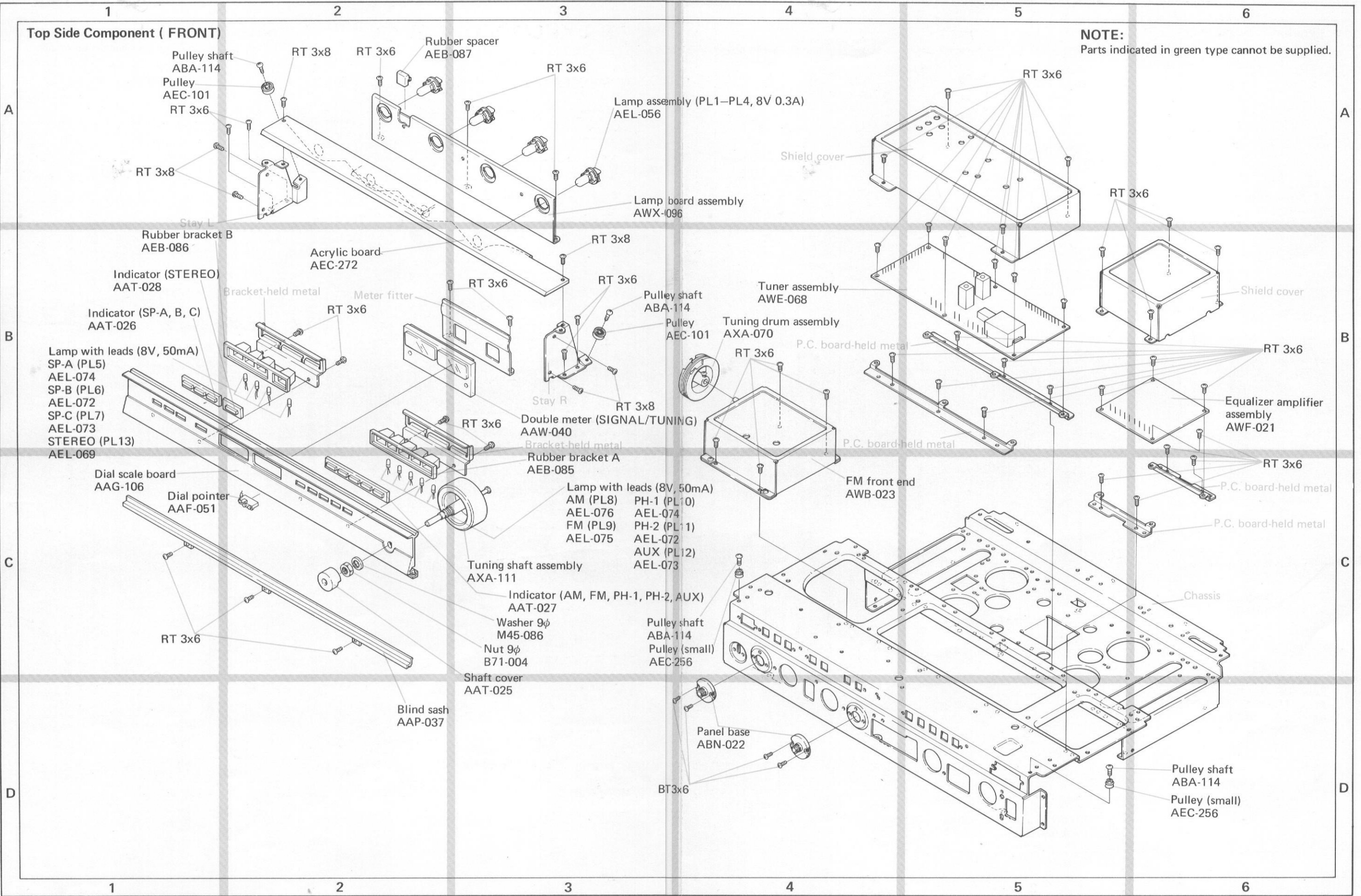
EXAMPLE





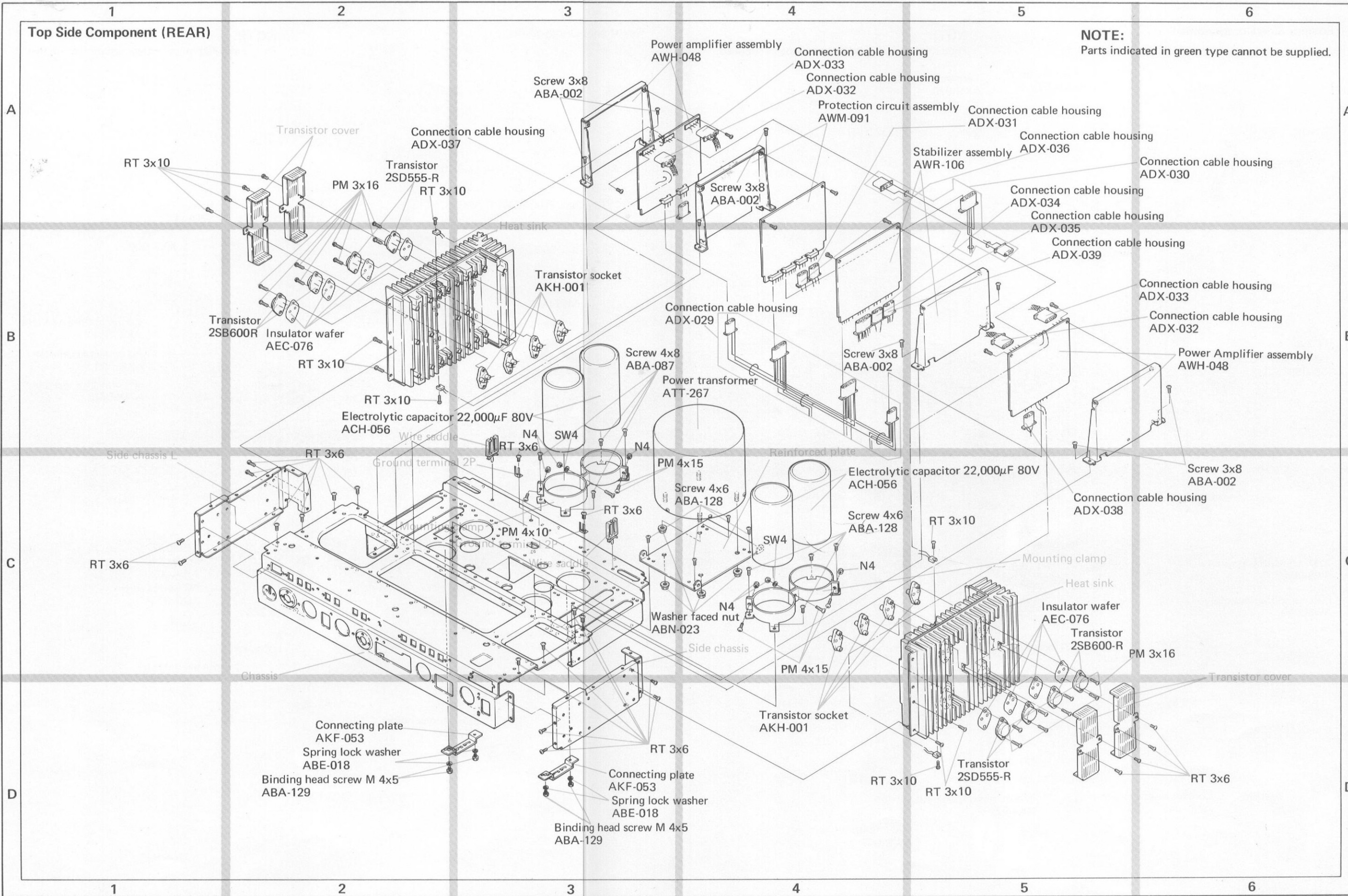
Top Side Component (FRONT)

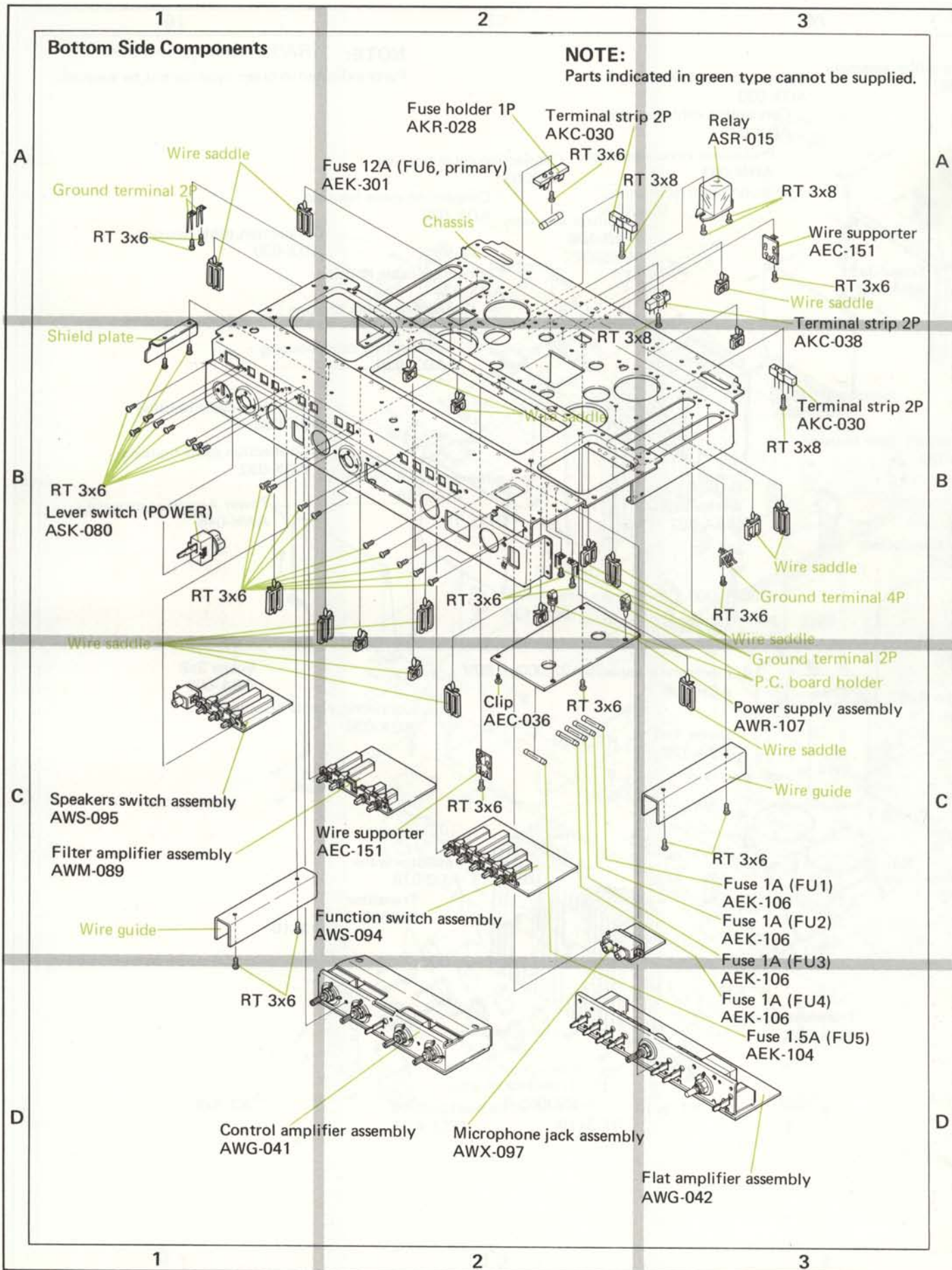
NOTE:
Parts indicated in green type cannot be supplied.



Top Side Component (REAR)

NOTE:
Parts indicated in green type cannot be supplied.





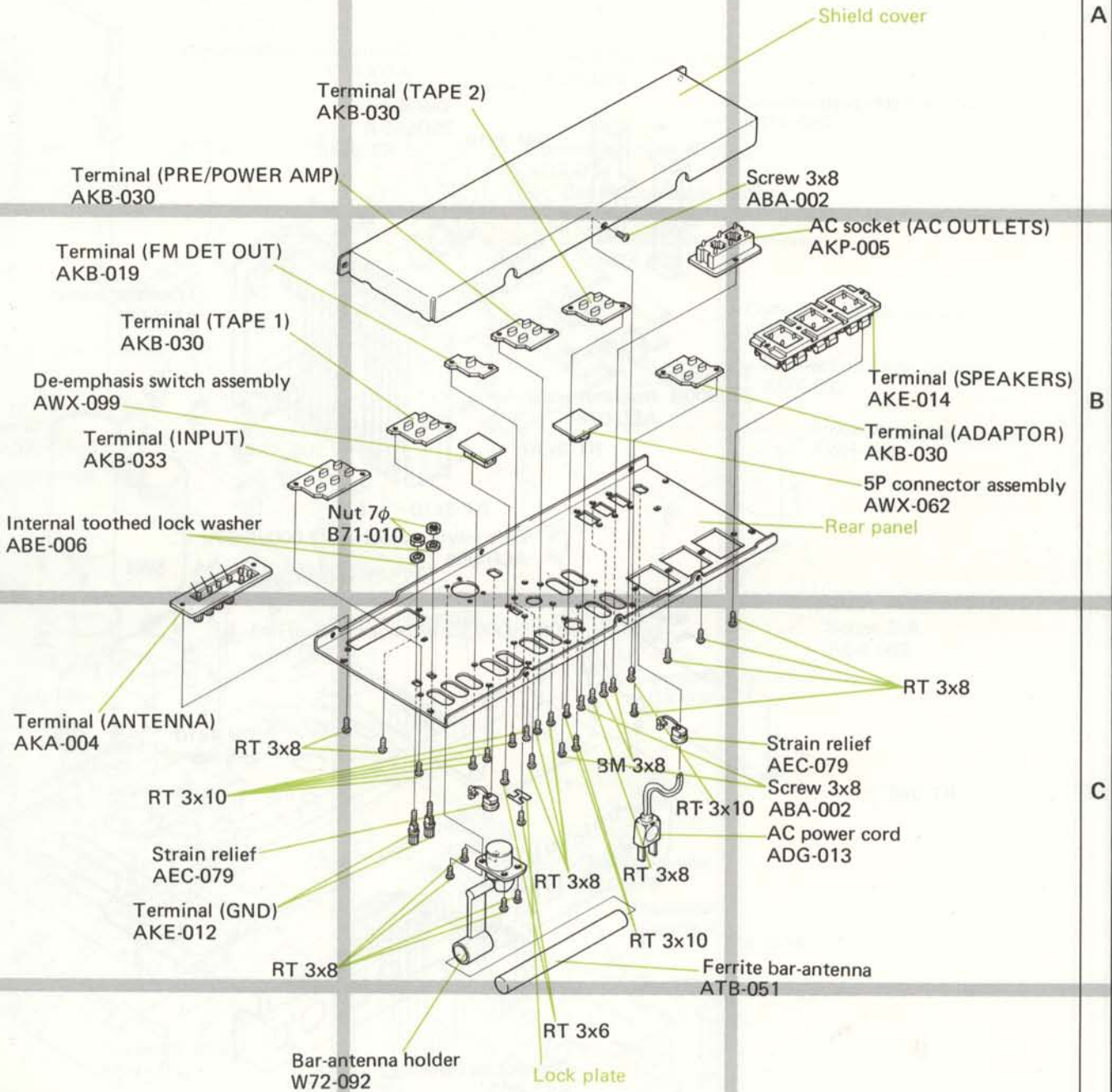
1

2

3

Rear Panel Component

NOTE:
Parts indicated in green type cannot be supplied.



1

2

3

B

Flat Amplifier Assembly (AWG-042)

NOTE:

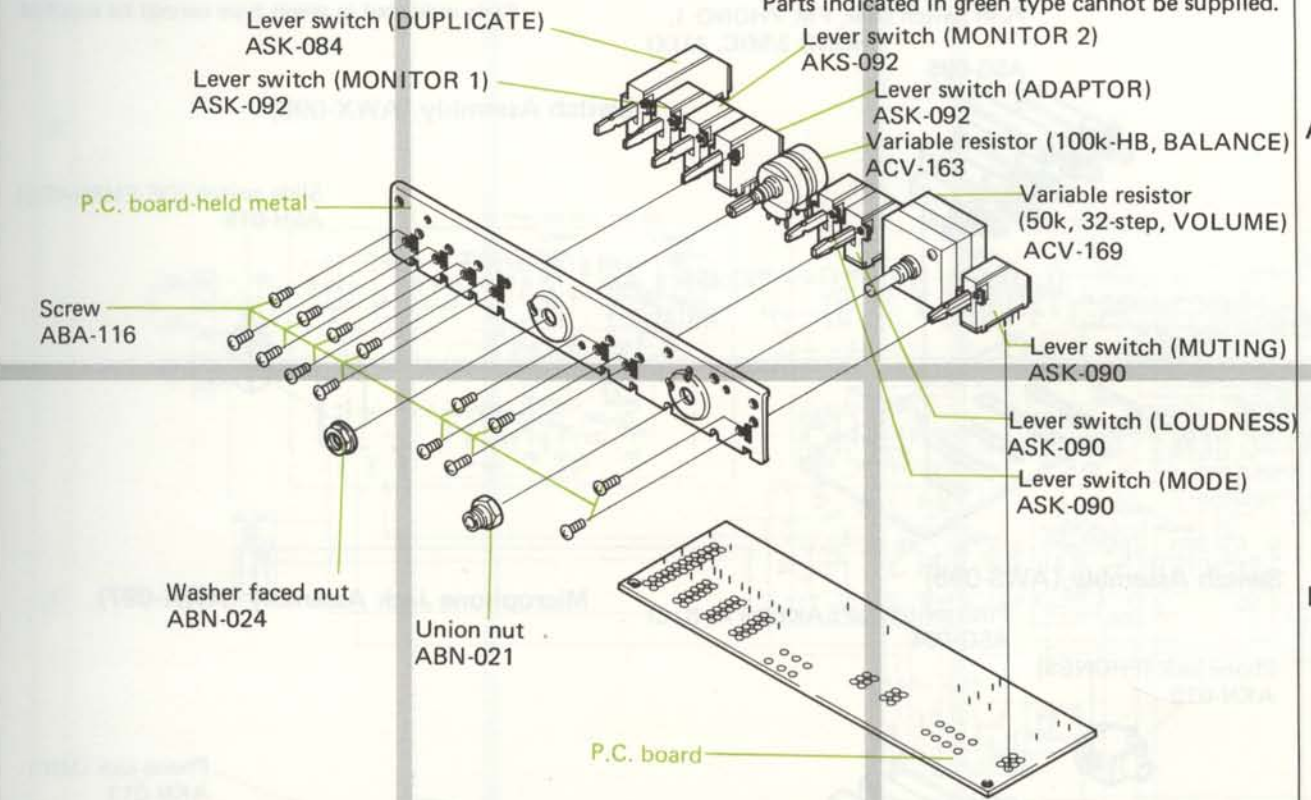
Parts indicated in green type cannot be supplied.

A

B

A

B



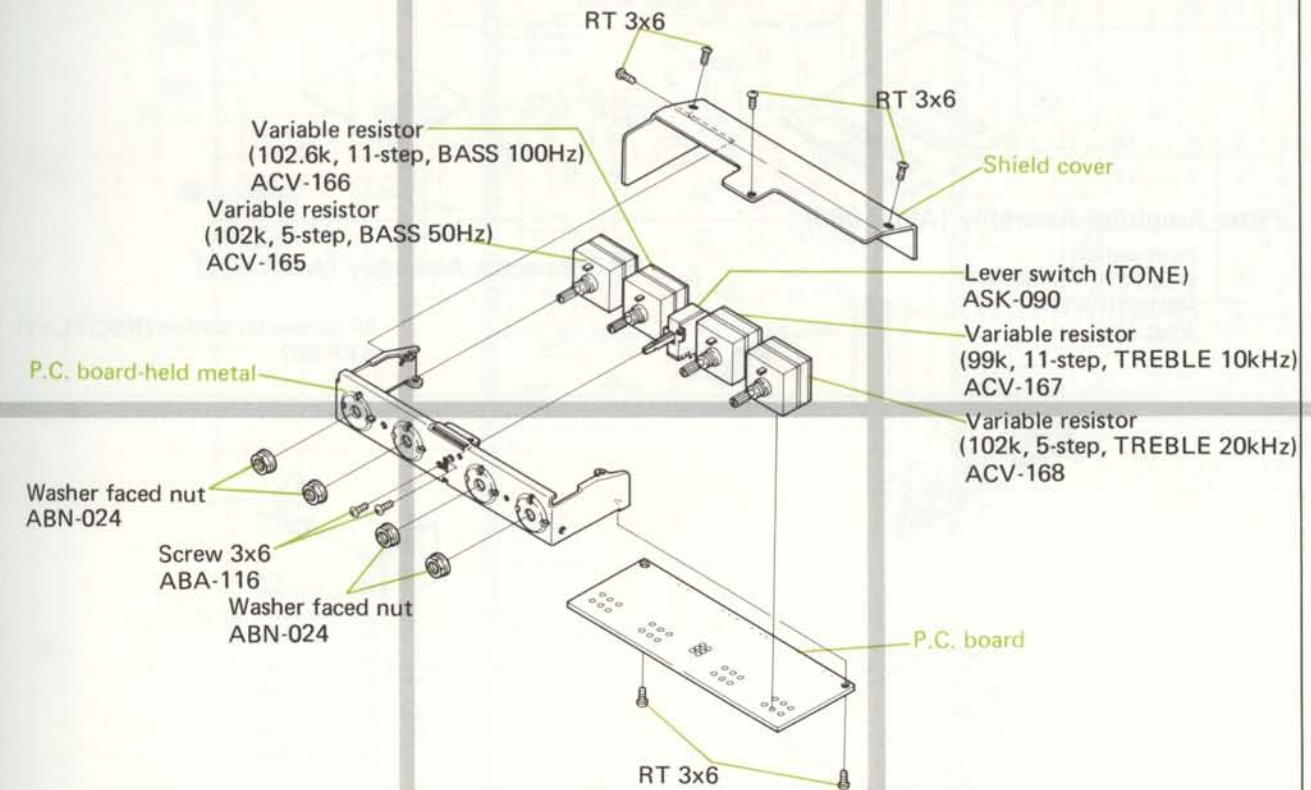
Control Amplifier Assembly (AWG-041)

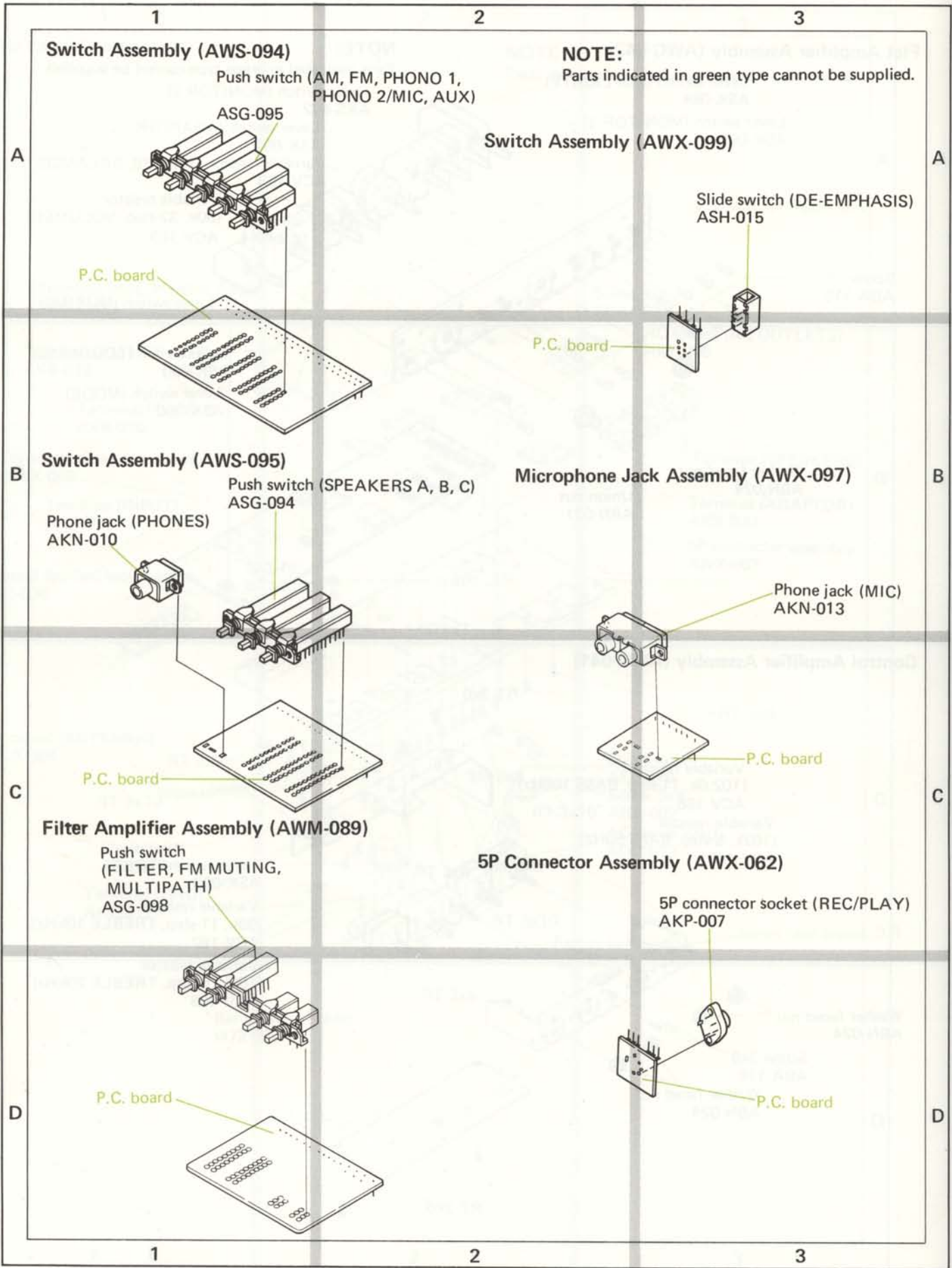
C

D

C

D





12. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LISTS

12.1 MISCELLANEOUS-PARTS

NOTE:

- Capacitors: in μF unless otherwise noted $p:pF$
- Resistors: in Ω , $\frac{1}{4}W$ unless otherwise noted $k:k\Omega$, $M:M\Omega$

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SB600-R
Q2	Transistor	2SB600-R
Q3	Transistor	2SD555-R
Q4	Transistor	2SD555-R
Q5	Transistor	2SB600-R
Q6	Transistor	2SB600-R
Q7	Transistor	2SD555-R
Q8	Transistor	2SD555-R

SWITCHES

Symbol	Description	Part No.
S1	Lever switch (POWER)	ASK-080
S2	Relay	ASR-015

LAMPS

Symbol	Description	Part No.
PL1	Lamp assembly (8V, 0.3A)	AEL-056
PL2	Lamp assembly (8V, 0.3A)	AEL-056
PL3	Lamp assembly (8V, 0.3A)	AEL-056
PL4	Lamp assembly (8V, 0.3A)	AEL-056
PL5	Lamp with leads (8V, 50mA, SP-A)	AEL-074
PL6	Lamp with leads (8V, 50mA, SP-B)	AEL-072
PL7	Lamp with leads (8V, 50mA, SP-C)	AEL-073
PL8	Lamp with leads (8V, 50mA, AM)	AEL-076
PL9	Lamp with leads (8V, 50mA, FM)	AEL-075
PL10	Lamp with leads (8V, 50mA, PH-1)	AEL-074
PL11	Lamp with leads (8V, 50mA, PH-2)	AEL-072
PL12	Lamp with leads (8V, 50mA, AUX)	AEL-073
PL13	Lamp with leads (8V, 50mA, STEREO)	AEL-069

FUSES

Symbol	Description	Part No.
FU1	Fuse 1A	AEK-106
FU2	Fuse 1A	AEK-106
FU3	Fuse 1A	AEK-106
FU4	Fuse 1A	AEK-106
FU5	Fuse 1.5A	AEK-104
FU6	Fuse 12A (primary)	AEK-301

COILS AND TRANSFORMER

Symbol	Description	Part No.
T1	Ferrite balun	T22-025
T2	Ferrite bar-antenna	ATB-051
T3	Power transformer	ATT-267

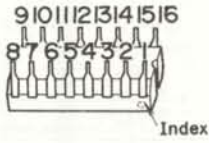

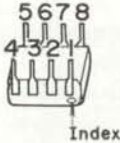
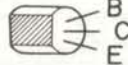
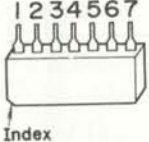
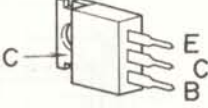
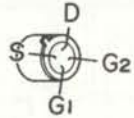
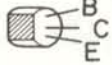
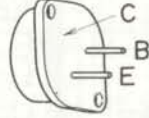
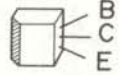
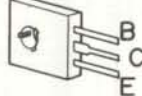
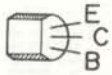
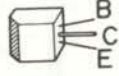
RESISTOR

Symbol	Description	Part No.
R1	Carbon film 2.2M $\frac{1}{4}W$	RD $\frac{1}{2}$ PS 225J

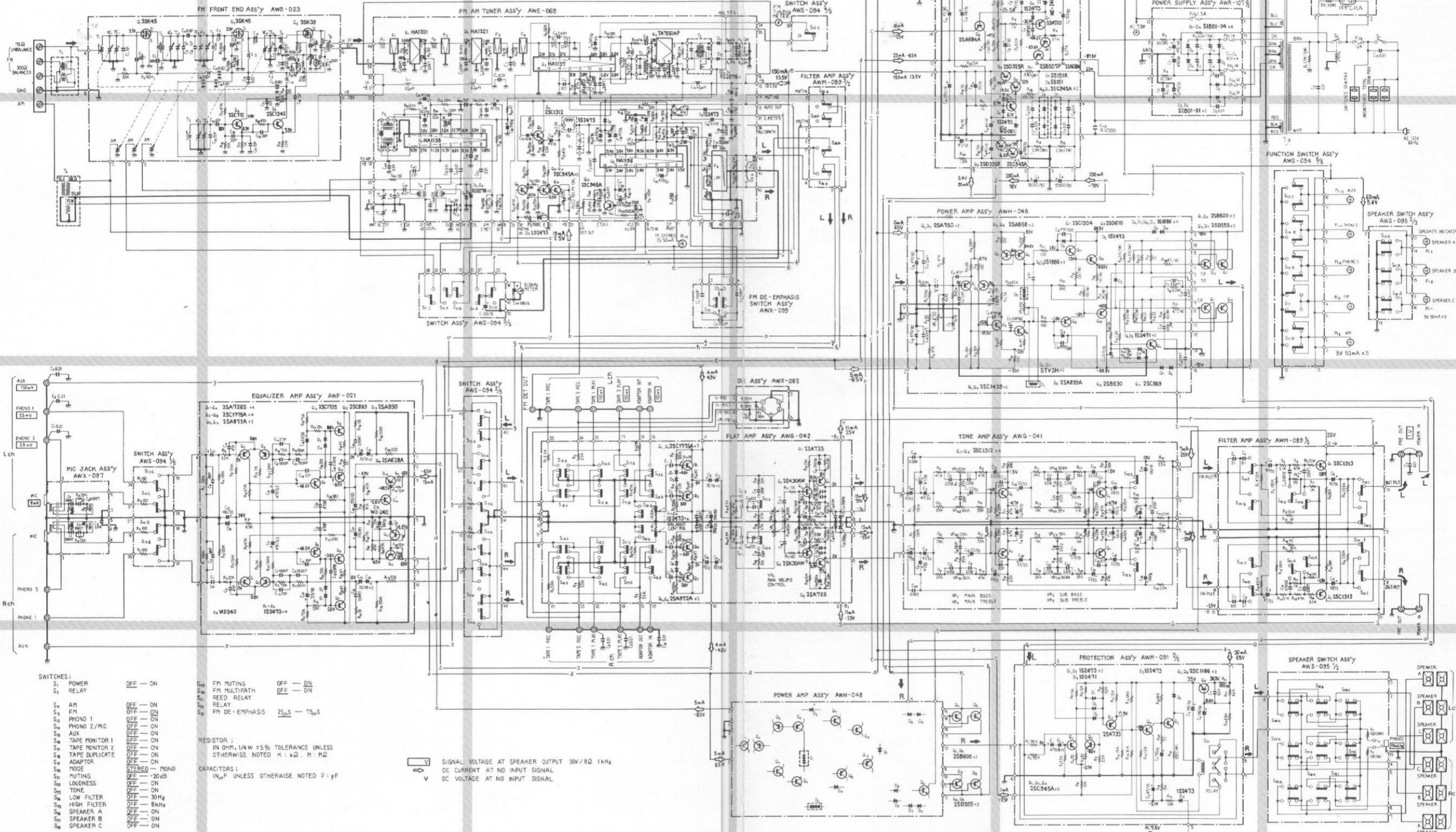
CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic 22,000 80V	ACH-056
C2	Electrolytic 22,000 80V	ACH-056
C3	Electrolytic 22,000 80V	ACH-056
C4	Electrolytic 22,000 80V	ACH-056
C5	Ceramic 0.01 50V	CKDYF 103Z 50
C6	Ceramic 0.01 50V	CKDYF 103Z 50
C7	Ceramic 0.01 50V	CKDYF 103Z 50
C8	Ceramic 0.01 50V	CKDYF 103Z 50
C9	Ceramic 0.01 50V	CKDYF 103Z 50
C10	Ceramic 0.01 50V	CKDYF 103Z 50
C11	Ceramic 0.01 50V	CKDYF 103Z 50
C12	Ceramic 0.01 150V (DC1.4kV)	ACG-003
C13	Ceramic 0.01 150V (DC1.4kV)	ACG-003
C14	Electrolytic 100 6V	CEA 101P 6
C18	Mylar 0.1 200V	CQMA 104K 200
C19	Mylar 0.1 200V	CQMA 104K 200

External Appearance of Transistors and ICs

<p>HA1137 HA1138 HA1196</p>		<p>2SK30AW</p>	
<p>HA1201</p>		<p>2SA684A 2SC1384</p>	
<p>TA7061AP</p>		<p>2SB507P 2SB630 2SD313P 2SD325R 2SD610</p>	
<p>3SK39 3SK45</p>		<p>2SA628 2SA720 2SA733 2SA750 2SA858 2SA872A 2SC945A 2SC1318 2SC1439 2SC1775A</p>	
<p>2SB600 2SD555</p>		<p>2SC1342</p>	
<p>2SA899A 2SC1904</p>		<p>2SA725 2SA726 2SA850 2SC710 2SC869 2SC1312 2SC1313 2SC1735</p>	
<p>2SC1166</p>			

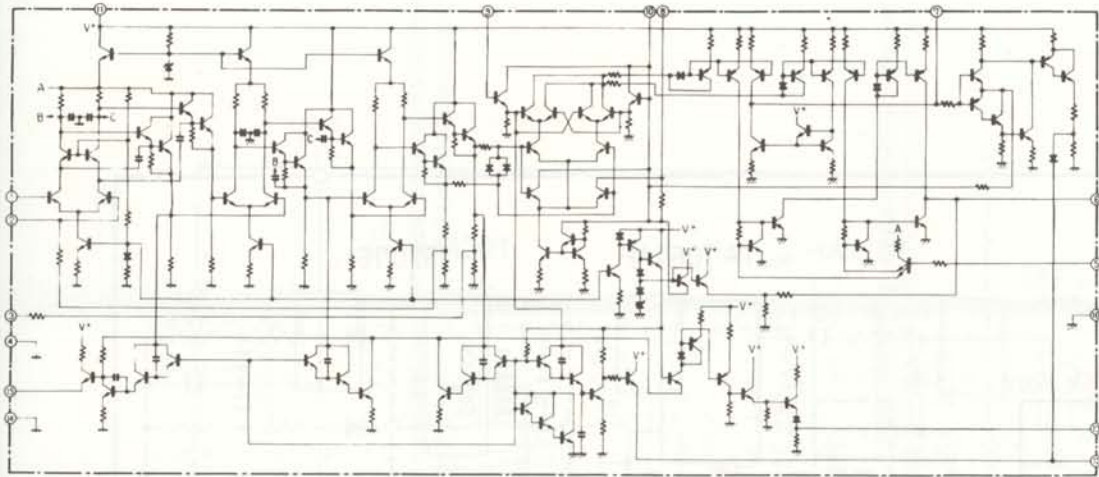
12.2 SCHEMATIC DIAGRAM



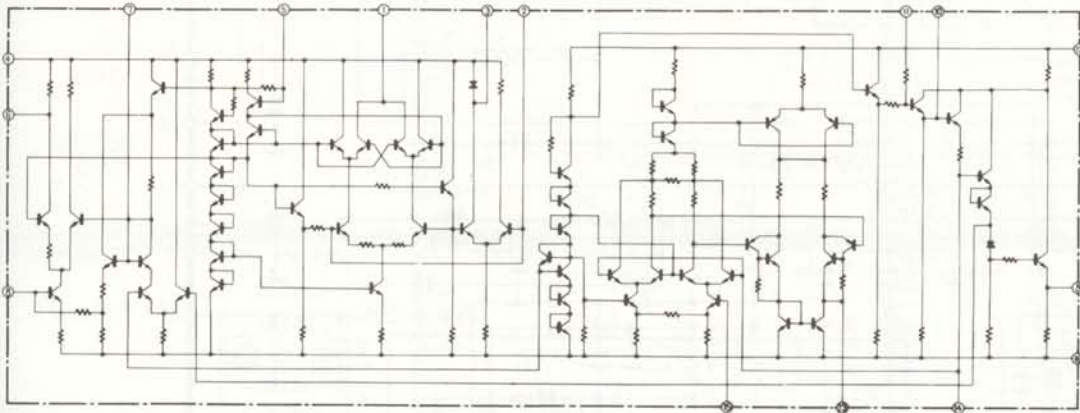
- SWITCHES:**
- | | | | |
|-------------------|---------------|---------------|-------------------------|
| S1 POWER | OFF — ON | FM MUTING | OFF — ON |
| S1 RELAY | OFF — ON | FM MULTIPATH | OFF — ON |
| S2 AM | OFF — ON | REED RELAY | OFF — ON |
| S3 FM | OFF — ON | FM DE-EMPHASS | 25 μ S — 75 μ S |
| S4 PHONO 1 | OFF — ON | | |
| S5 PHONO 2/MIC | OFF — ON | | |
| S6 AUX | OFF — ON | | |
| S7 TAPE MONITOR 1 | OFF — ON | | |
| S8 TAPE MONITOR 2 | OFF — ON | | |
| S9 TAPE DUPLICATE | OFF — ON | | |
| S10 ADAPTOR | OFF — ON | | |
| S11 MODE | STEREO — MONO | | |
| S12 MUTING | OFF — ON | | |
| S13 LOUDNESS | OFF — ON | | |
| S14 TONE | OFF — ON | | |
| S15 LOW FILTER | OFF — ON | | |
| S16 HIGH FILTER | OFF — ON | | |
| S17 SPEAKER A | OFF — ON | | |
| S18 SPEAKER B | OFF — ON | | |
| S19 SPEAKER C | OFF — ON | | |
- RESISTOR:**
IN OHM, 1/4W \pm 5% TOLERANCE UNLESS OTHERWISE NOTED K: k Ω , M: M Ω
- CAPACITORS:**
IN μ F UNLESS OTHERWISE NOTED P: pF
- Legend:**
V: SIGNAL VOLTAGE AT SPEAKER OUTPUT 30W/8 Ω 1kHz
DC: DC CURRENT AT NO INPUT SIGNAL
DCV: DC VOLTAGE AT NO INPUT SIGNAL

12.3 INTERNAL CIRCUITRY OF INTEGRATED CIRCUITS

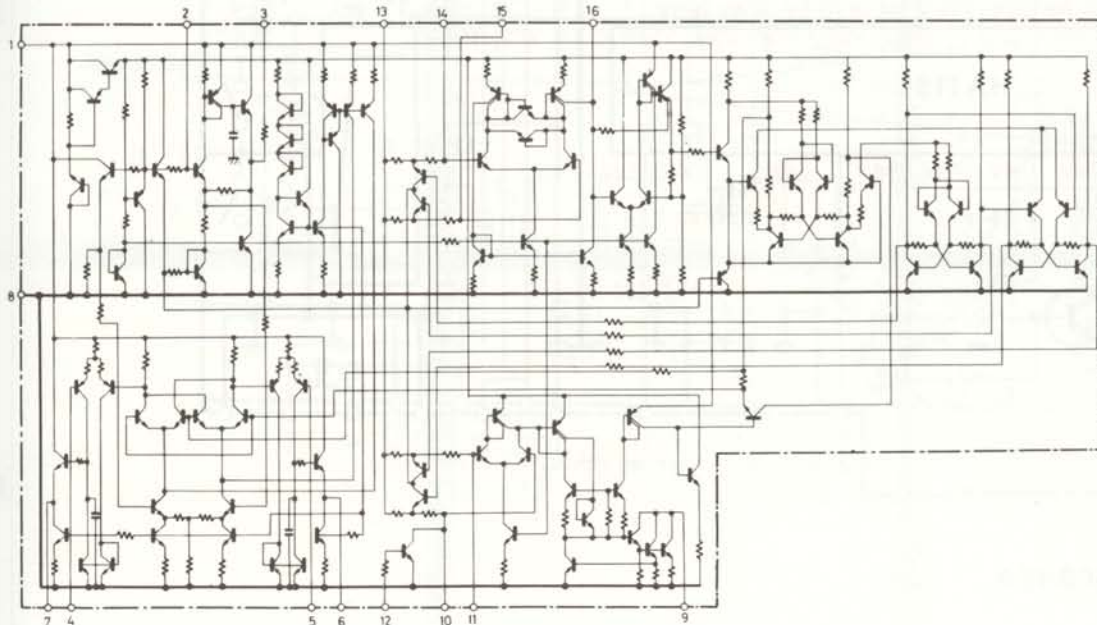
HA1137 (FM IF IC)



HA1138 (AM IC)

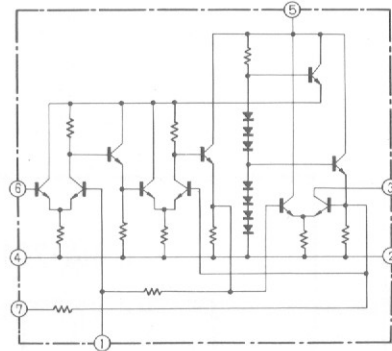
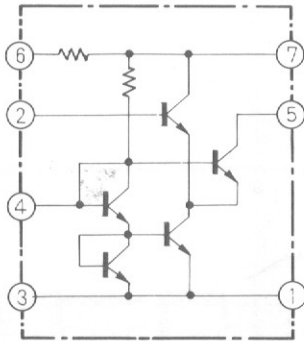


HA1196

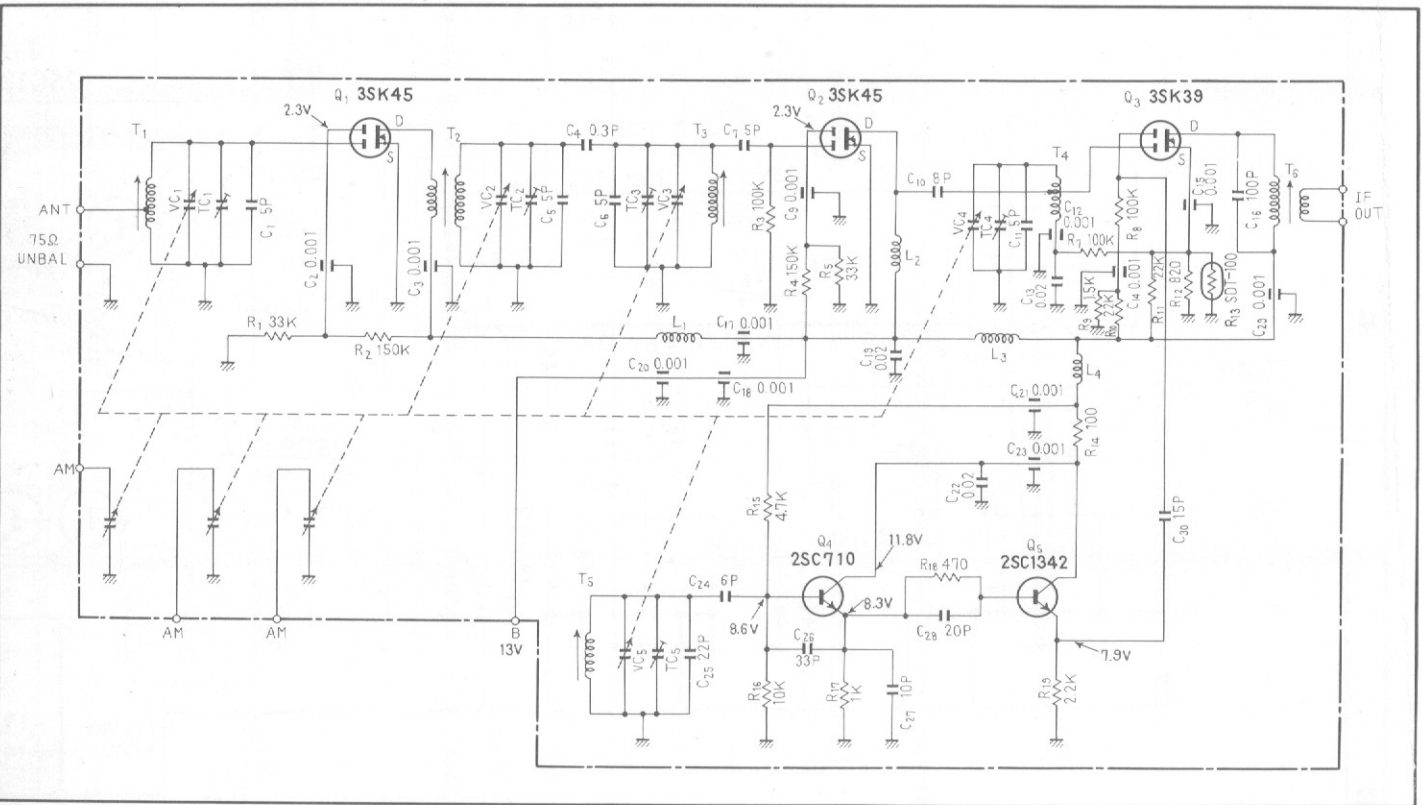


HA1201

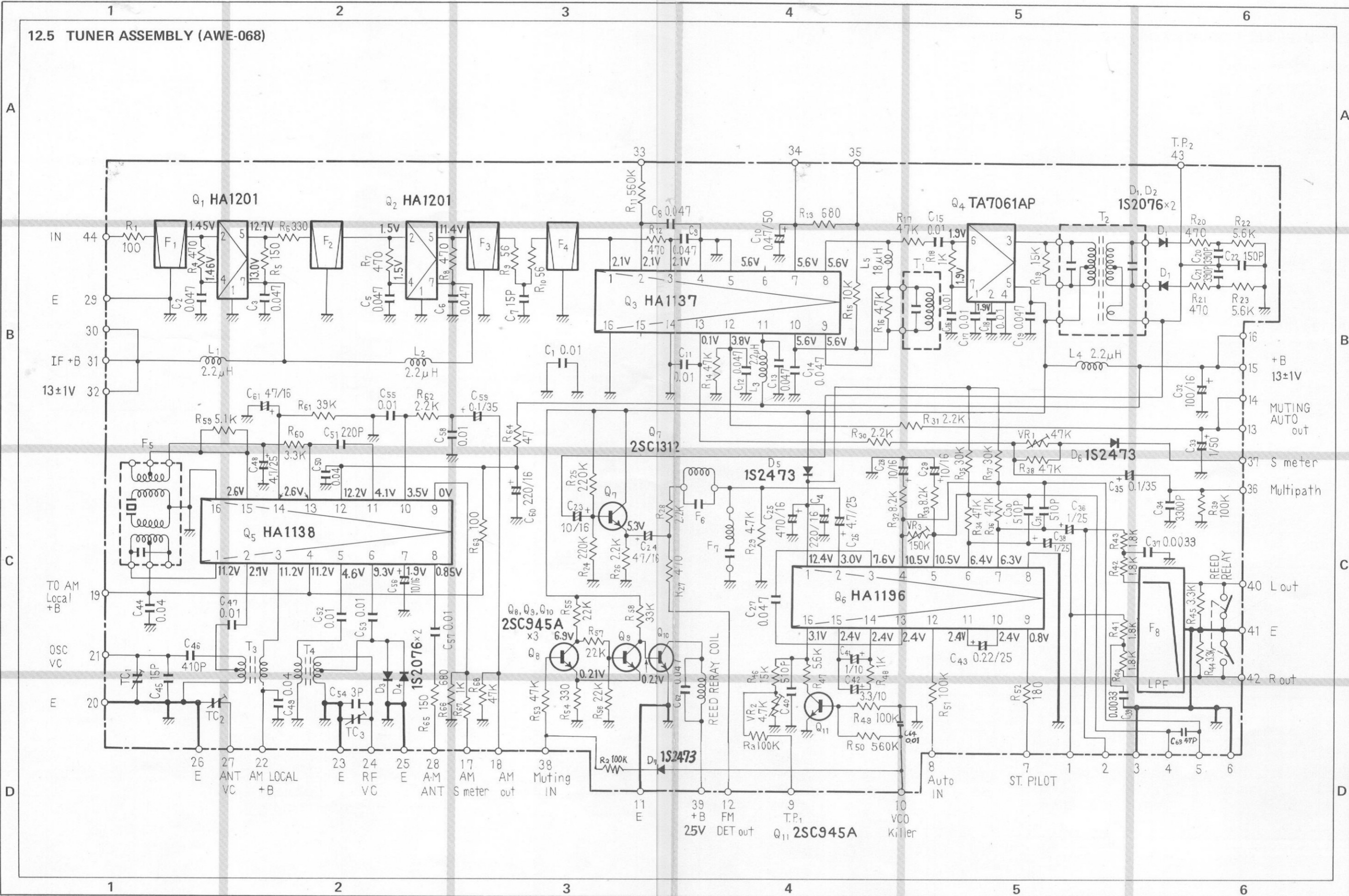
TA 7061AP

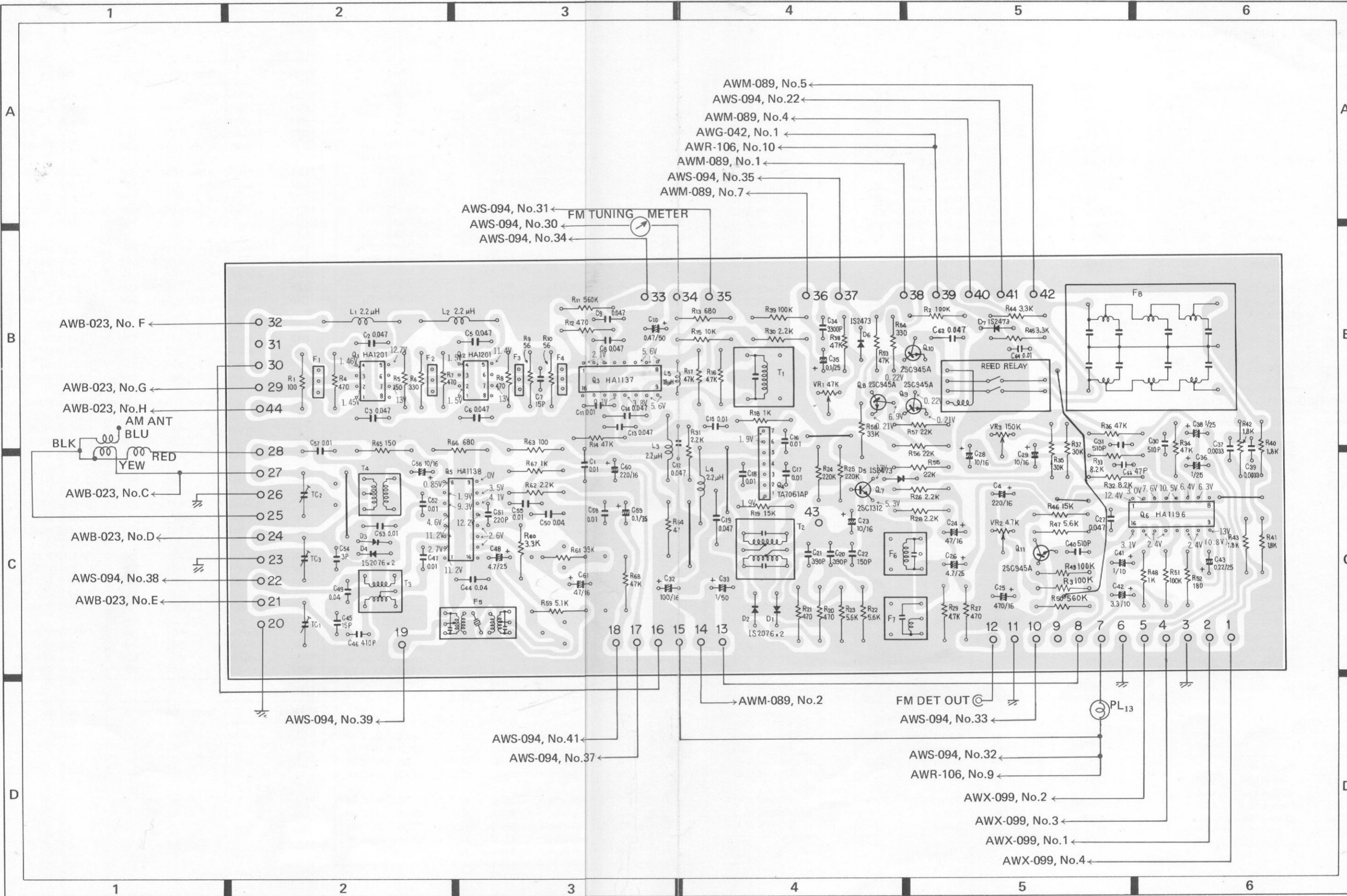


12.4 THE CIRCUIT OF FM FRONT END (AWB-023)



12.5 TUNER ASSEMBLY (AWE-068)





Parts List of Tuner Assembly (AWE-068)

SEMICONDUCTOR

Symbol	Description	Part No.
Q1	IC	HA1201
Q2	IC	HA1201
Q3	IC	HA1137
Q4	IC	TA7061AP
Q5	IC	HA1138
Q6	IC	HA1196
Q7	Transistor	2SC1312-G
Q8	Transistor	2SC945A-Q
Q9	Transistor	2SC945A-Q
Q10	Transistor	2SC945A-Q
Q11	Transistor	2SC945A-Q
D1	Diode	1S2076
D2	Diode	1S2076
D3	Diode	1S2076
D4	Diode	1S2076
D5	Diode	1S2473
D6	Diode	1S2473
D7	Diode	1S2473

TRANSFORMERS AND COILS

Symbol	Description	Part No.
T1	FM IF transformer	ATE-029
T2	FM DET transformer	ATE-013
T3	AM oscillator coil	ATB-019
T4	AF RF coil	ATB-020
F1	FM ceramic filter	ATF-018
F2	FM ceramic filter	ATF-018
F3	FM ceramic filter	ATF-018
F4	FM ceramic filter	ATF-018
F5	AM ceramic filter	ATF-027
F6	Anti-birby filter	ATF-023
F7	Anti-birby filter	ATF-024
F8	FM lowpass filter	ATF-028
L1	RF choke coil 2.2 μ H	T24-028
L2	RF choke coil 2.2 μ H	T24-028
L3	RF choke coil 2.2 μ H	T24-028
L4	RF choke coil 2.2 μ H	T24-028
L5	RF choke coil 18 μ H	ATH-007

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 100	RD $\frac{1}{4}$ PS 101J
R2	Carbon film 100k	RD $\frac{1}{4}$ PS 104J
R3	Carbon film 100k	RD $\frac{1}{4}$ PS 104J
R4	Carbon film 470	RD $\frac{1}{4}$ PS 471J
R5	Carbon film 150	RD $\frac{1}{4}$ PS 151J

Symbol	Description	Part No.
R6	Carbon film 330	RD $\frac{1}{4}$ PS 331J
R7	Carbon film 470	RD $\frac{1}{4}$ PS 471J
R8	Carbon film 470	RD $\frac{1}{4}$ PS 471J
R9	Carbon film 56	RD $\frac{1}{4}$ PS 560J
R10	Carbon film 56	RD $\frac{1}{4}$ PS 560J
R11	Carbon film 560k	RD $\frac{1}{4}$ PS 564J
R12	Carbon film 470	RD $\frac{1}{4}$ PS 471J
R13	Carbon film 680	RD $\frac{1}{4}$ PS 681J
R14	Carbon film 47k	RD $\frac{1}{4}$ PS 473J
R15	Carbon film 10k	RD $\frac{1}{4}$ PS 103J
R16	Carbon film 4.7k	RD $\frac{1}{4}$ PS 472J
R17	Carbon film 47k	RD $\frac{1}{4}$ PS 473J
R18	Carbon film 1k	RD $\frac{1}{4}$ PS 102J
R19	Carbon film 15k	RD $\frac{1}{4}$ PS 153J
R20	Carbon film 470	RD $\frac{1}{4}$ PS 471J
R21	Carbon film 470	RD $\frac{1}{4}$ PS 471J
R22	Carbon film 5.6k	RD $\frac{1}{4}$ PS 562J
R23	Carbon film 5.6k	RD $\frac{1}{4}$ PS 562J
R24	Carbon film 220k	RD $\frac{1}{4}$ PS 224JNL
R25	Carbon film 220k	RD $\frac{1}{4}$ PS 224JNL
R26	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222J
R27	Carbon film 470	RD $\frac{1}{4}$ PS 471J
R28	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222J
R29	Carbon film 4.7k	RD $\frac{1}{4}$ PS 472J
R30	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222J
R31	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222J
R32	Carbon film 8.2k	RD $\frac{1}{4}$ PS 822J
R33	Carbon film 8.2k	RD $\frac{1}{4}$ PS 822J
R34	Carbon film 47k	RD $\frac{1}{4}$ PS 473J
R35	Carbon film 30k	RD $\frac{1}{4}$ PS 303J
R36	Carbon film 47k	RD $\frac{1}{4}$ PS 473J
R37	Carbon film 30k	RD $\frac{1}{4}$ PS 303J
R38	Carbon film 47k	RD $\frac{1}{4}$ PS 473J
R39	Carbon film 100k	RD $\frac{1}{4}$ PS 104J
R40	Carbon film 1.8k	RD $\frac{1}{4}$ PS 182J
R41	Carbon film 1.8k	RD $\frac{1}{4}$ PS 182J
R42	Carbon film 1.8k	RD $\frac{1}{4}$ PS 182J
R43	Carbon film 1.8k	RD $\frac{1}{4}$ PS 182J
R44	Carbon film 3.3k	RD $\frac{1}{4}$ PS 332J
R45	Carbon film 3.3k	RD $\frac{1}{4}$ PS 332J
R46	Carbon film 15k	RD $\frac{1}{4}$ PS 153J
R47	Carbon film 5.6k	RD $\frac{1}{4}$ PS 562J
R48	Carbon film 1k	RD $\frac{1}{4}$ PS 102J
R49	Carbon film 100k	RD $\frac{1}{4}$ PS 104J
R50	Carbon film 560k	RD $\frac{1}{4}$ PS 564J
R51	Carbon film 100k	RD $\frac{1}{4}$ PS 104J
R52	Carbon film 180	RD $\frac{1}{4}$ PS 181J
R53	Carbon film 47k	RD $\frac{1}{4}$ PS 473J

Symbol	Description	Part No.
R54	Carbon film 330	RD%PS 331J
R55	Carbon film 22k	RD%PS 223J
R56	Carbon film 22k	RD%PS 223J
R57	Carbon film 22k	RD%PS 223J
R58	Carbon film 33k	RD%PS 333J
R59	Carbon film 5.1k	RD%PS 512J
R60	Carbon film 3.3k	RD%PS 332J
R61	Carbon film 39k	RD%PS 393J
R62	Carbon film 2.2k	RD%PS 222J
R63	Carbon film 100	RD%PS 101J
R64	Carbon film 47	RD%PS 470J
R65	Carbon film 150	RD%PS 151J
R66	Carbon film 680	RD%PS 681J
R67	Carbon film 1k	RD%PS 102J
R68	Carbon film 47k	RD%PS 473J
VR1	Semi-fixed 47k-B	C92-048
VR2	Semi-fixed 4.7k-B	ACP-018
VR3	Semi-fixed 150k-B	ACP-014

CAPACITORS

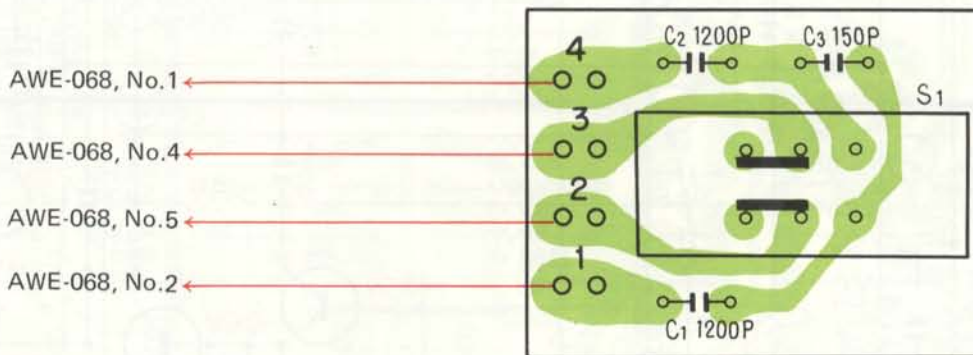
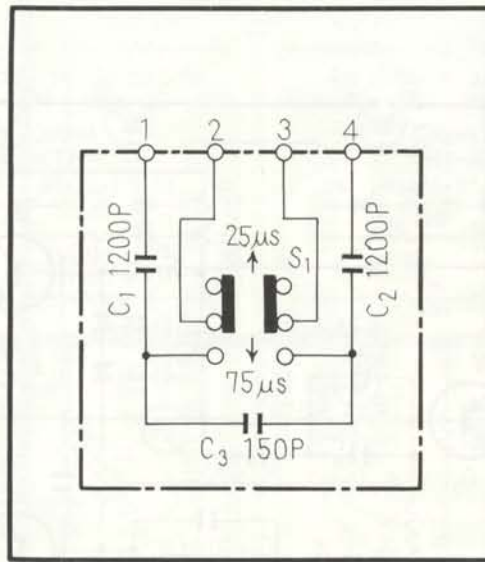
Symbol	Description	Part No.
TC1	Film trimmer	ACM-002
TC2	Film trimmer	ACM-002
TC3	Film trimmer	ACM-002
C1	Ceramic 0.01 50V	CKDYF 103Z 50
C2	Ceramic 0.047 25V	CKDBC 473Z 25
C3	Ceramic 0.047 25V	CKDBC 473Z 25
C4	Electrolytic 220 16V	CEA 221P 16
C5	Ceramic 0.047 25V	CKDBC 473Z 25
C6	Ceramic 0.047 25V	CKDBC 473Z 25
C7	Ceramic 15p 50V	CCDSL 150K 50
C8	Ceramic 0.047 25V	CKDBC 473Z 25
C9	Ceramic 0.047 25V	CKDBC 473Z 25
C10	Electrolytic 0.47 50V	CEA R47P 50
C11	Ceramic 0.01 50V	CKDYF 103Z 50
C12	Ceramic 0.047 25V	CKDBC 473Z 25
C13	Ceramic 0.047 25V	CKDBC 473Z 25
C14	Ceramic 0.047 25V	CKDBC 473Z 25
C15	Ceramic 0.01 50V	CKDYF 103Z 50
C16	Ceramic 0.01 50V	CKDYF 103Z 50
C17	Ceramic 0.01 50V	CKDYF 103Z 50
C18	Ceramic 0.01 50V	CKDYF 103Z 50
C19	Ceramic 0.047 25V	CKDBC 473Z 25
C20	Ceramic 390p 50V	CCKSL 391K 50
C21	Ceramic 390p 50V	CCDSL 391K 50
C22	Ceramic 150p 50V	CCDSL 151K 50
C23	Electrolytic 10 16V	CSZA 100M 16
C24	Electrolytic 47 16V	CEANL 470P 16
C25	Electrolytic 470 16V	CEA 471P 16

Symbol	Description	Part No.
C26	Electrolytic 4.7 25V	CEANL 4R7P 25
C27	Mylar 0.047 50V	CQMA 473J 50
C28	Electrolytic 10 16V	CEANL 100P 16
C29	Electrolytic 10 16V	CEANL 100P 16
C30	Polystyrene film 510p 50V	CQSA 511J 50
C31	Polystyrene film 510p 50V	CQSA 511J 50
C32	Electrolytic 100 16V	CEA 101P 16
C33	Electrolytic 1 50V	CEA 010P 50
C34	Ceramic 0.0033 50V	CKDYA 332J 50
C35	Electrolytic 0.1 35V	CSZA 0R1M 35
C36	Electrolytic 1 25V	CEANL 010P 25
C37	Mylar 0.0033 50V	CQMA 332J 50
C38	Electrolytic 1 25V	CEANL 010P 25
C39	Mylar 0.0033 50V	CQMA 332J 50
C40	Polystyrene film 510p 50V	CQSH 511J 50
C41	Electrolytic 1 10V	CSSA 010M 10
C42	Electrolytic 3.3 10V	CSSA 3R3M 10
C43	Electrolytic 0.22 25V	CSSA R22M 25
C44	Ceramic 0.04 50V	CKDYF 403Z 50
C45	Ceramic 15p 50V	CCDWK 150K 50
C46	Polystyrene film 410p 50V	CQSA 411J 50
C47	Ceramic 0.01 50V	CKDYA 103J 50
C48	Electrolytic 4.7 25V	CEA 4R7P 25
C49	Ceramic 0.04 50V	CKDYF 403Z 50
C50	Ceramic 0.04 50V	CKDYF 403Z 50
C51	Ceramic 220p 50V	CCDSL 221K 50
C52	Ceramic 0.01 50V	CKDYF 103Z 50
C53	Ceramic 0.01 50V	CKDYF 103Z 50
C54	Ceramic 3p 50V	CCDSH 030D 50
C55	Ceramic 0.01 50V	CKDYF 103Z 50
C56	Electrolytic 10 16V	CEA 100P 16
C57	Ceramic 0.01 50V	CKDYF 103Z 50
C58	Ceramic 0.01 50V	CKDYF 103Z 50
C59	Electrolytic 0.1 35V	CSZA 0R1M 35
C60	Electrolytic 220 16V	CEA 221P 16
C61	Electrolytic 47 16V	CEA 470P 16
C62	Ceramic 0.047 25V	CKDBC 473Z 25
C63	Ceramic 47p 50V	CCDSL 470K 50
C64	Ceramic 0.01 50V	CKDYF 103Z 50

OTHER

Symbol	Description	Part No.
	Reed relay	ASR-005

12.6 DE-EMPHASIS SWITCH ASSEMBLY (AWX-099)



Parts List of De-emphasis Switch Assembly (AWX-099)

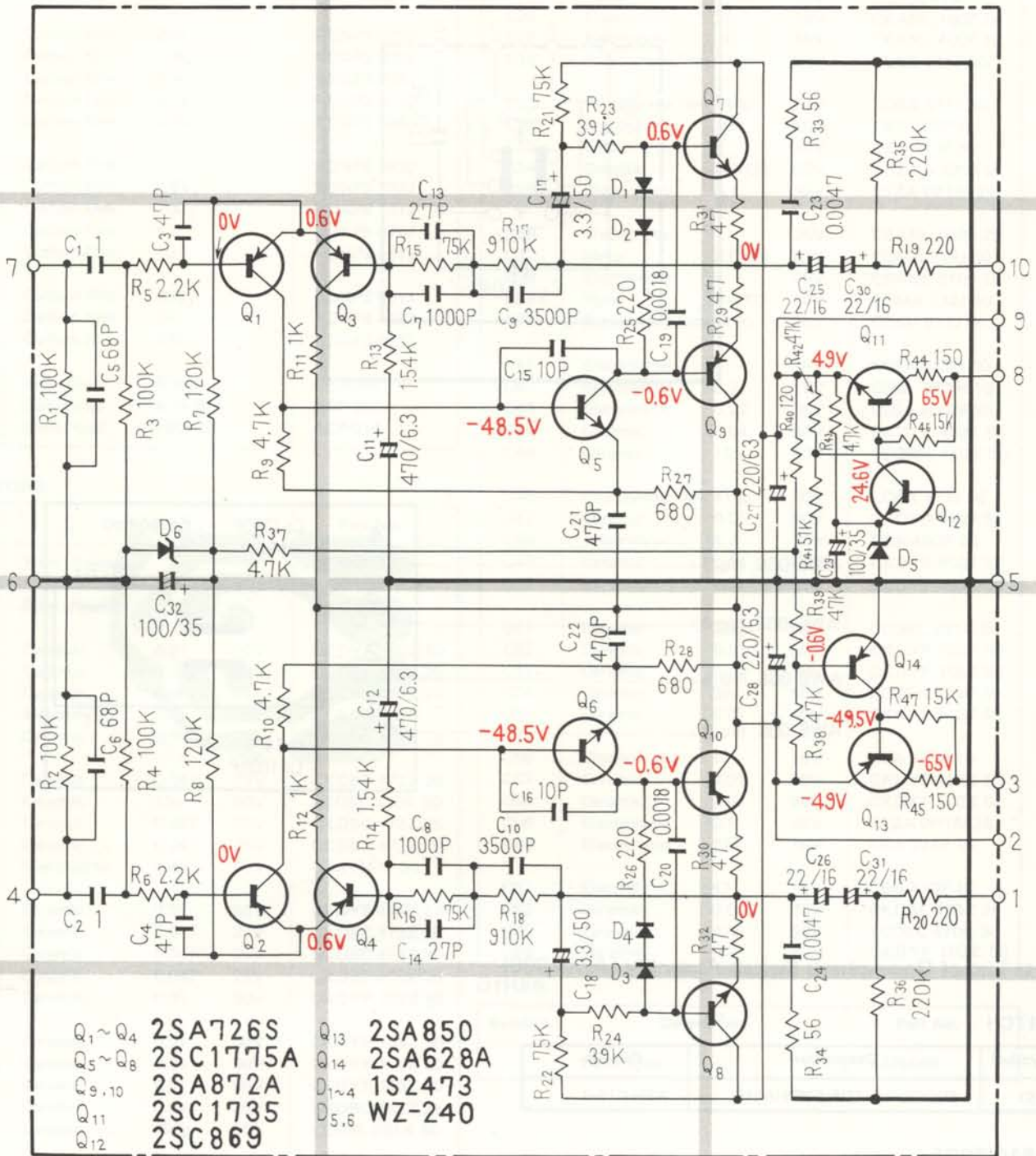
SWITCH

Symbol	Description	Part No.
S1	Slide switch (DE-EMPHASIS)	ASH-015-0

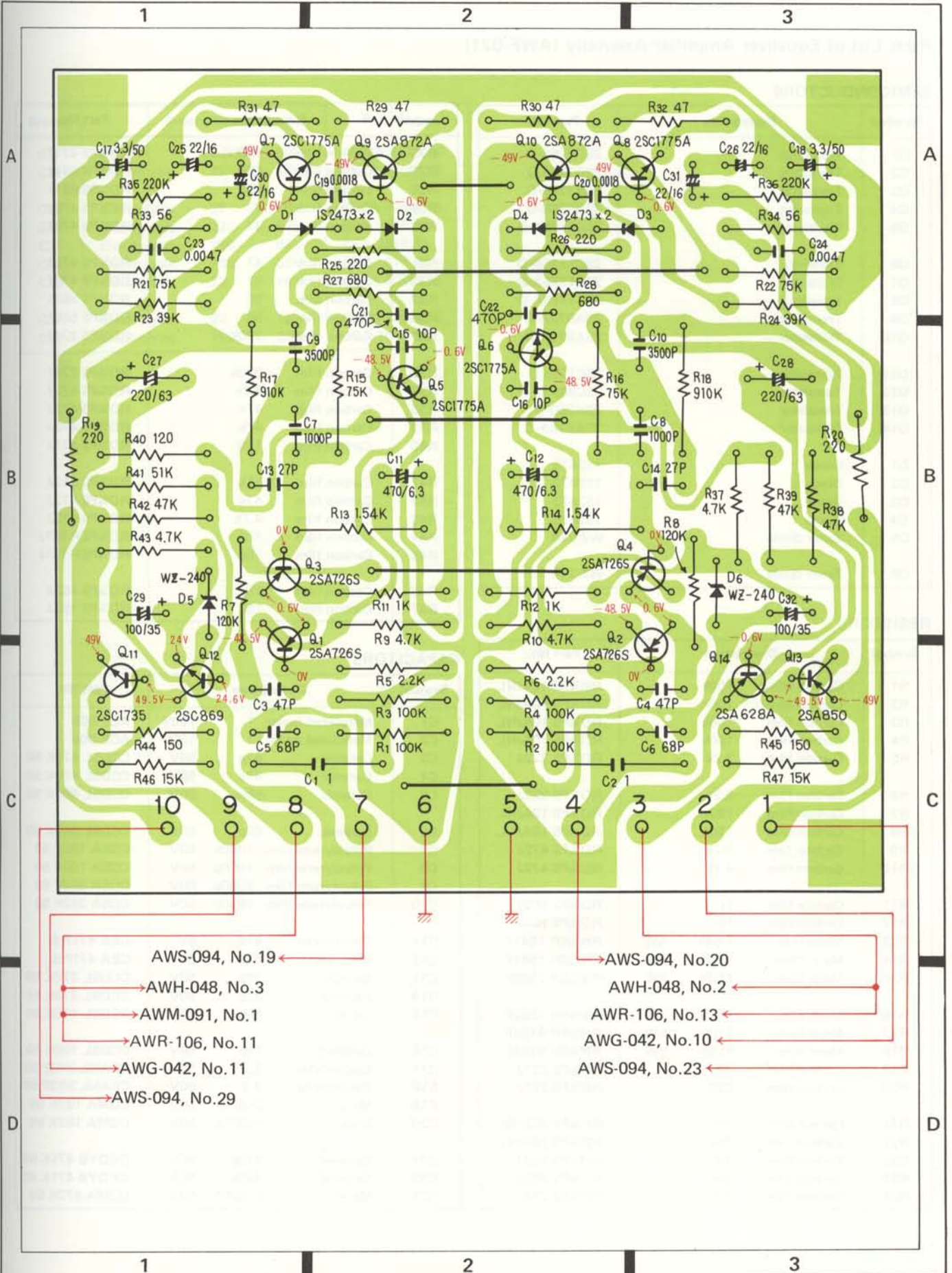
CAPACITORS

Symbol	Description	Part No.
C1	Mylar 1200p 50V	CQMA 122J 50
C2	Mylar 1200p 50V	CQMA 122J 50
C3	Ceramic 150p 50V	CCDSL 151K 50

12.7 EQUALIZER AMPLIFIER ASSEMBLY (AWF-021)



Q ₁ ~ Q ₄	2SA726S	Q ₁₃	2SA850
Q ₅ ~ Q ₈	2SC1775A	Q ₁₄	2SA628A
Q _{9, 10}	2SA872A	D ₁₋₄	1S2473
Q ₁₁	2SC1735	D _{5, 6}	WZ-240
Q ₁₂	2SC869		



AWS-094, No. 19

AWH-048, No. 3

AWM-091, No. 1

AWR-106, No. 11

AWG-042, No. 11

AWS-094, No. 29

AWS-094, No. 20

AWH-048, No. 2

AWR-106, No. 13

AWG-042, No. 10

AWS-094, No. 23

Parts List of Equalizer Amplifier Assembly (AWF-021)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SA726S-G
Q2	Transistor	2SA726S-G
Q3	Transistor	2SA726S-G
Q4	Transistor	2SA726S-G
Q5	Transistor	2SC1775A-D
Q6	Transistor	2SC1775A-D
Q7	Transistor	2SC1775A-D
Q8	Transistor	2SC1775A-D
Q9	Transistor	2SA872A-D
Q10	Transistor	2SA872A-D
Q11	Transistor	2SC1735-D
Q12	Transistor	2SC869-C
Q13	Transistor	2SA850-D
Q14	Transistor	2SA628A-C
D1	Diode	1S2473
D2	Diode	1S2473
D3	Diode	1S2473
D4	Diode	1S2473
D5	Zener diode	WZ-240
D6	Zener diode	WZ-240

Symbol	Description	Part No.
R26	Carbon film 220	RD½PS 221J
R27	Carbon film 680	RD½PS 681J
R28	Carbon film 680	RD½PS 681J
R29	Carbon film 47	RD½PS 470J
R30	Carbon film 47	RD½PS 470J
R31	Carbon film 47	RD½PS 470J
R32	Carbon film 47	RD½PS 470J
R33	Carbon film 56	RD½PS 560J
R34	Carbon film 56	RD½PS 560J
R35	Carbon film 220k	RD½PS 224J
R36	Carbon film 220k	RD½PS 224J
R37	Carbon film 4.7k	RD½PS 472J
R38	Carbon film 47k	RD½PS 473J
R39	Carbon film 47k	RD½PS 473J
R40	Carbon film 120	RD½PS 121J
R41	Carbon film 51k	RD½PS 513J
R42	Carbon film 47k	RD½PS 473J
R43	Carbon film 4.7k	RD½PS 472J
R44	Carbon film 150	RD½PSF 151J
R45	Carbon film 150	RD½PSF 151J
R46	Carbon film 15k	RD½PS 153J
R47	Carbon film 15k	RD½PS 153J

RESISTORS

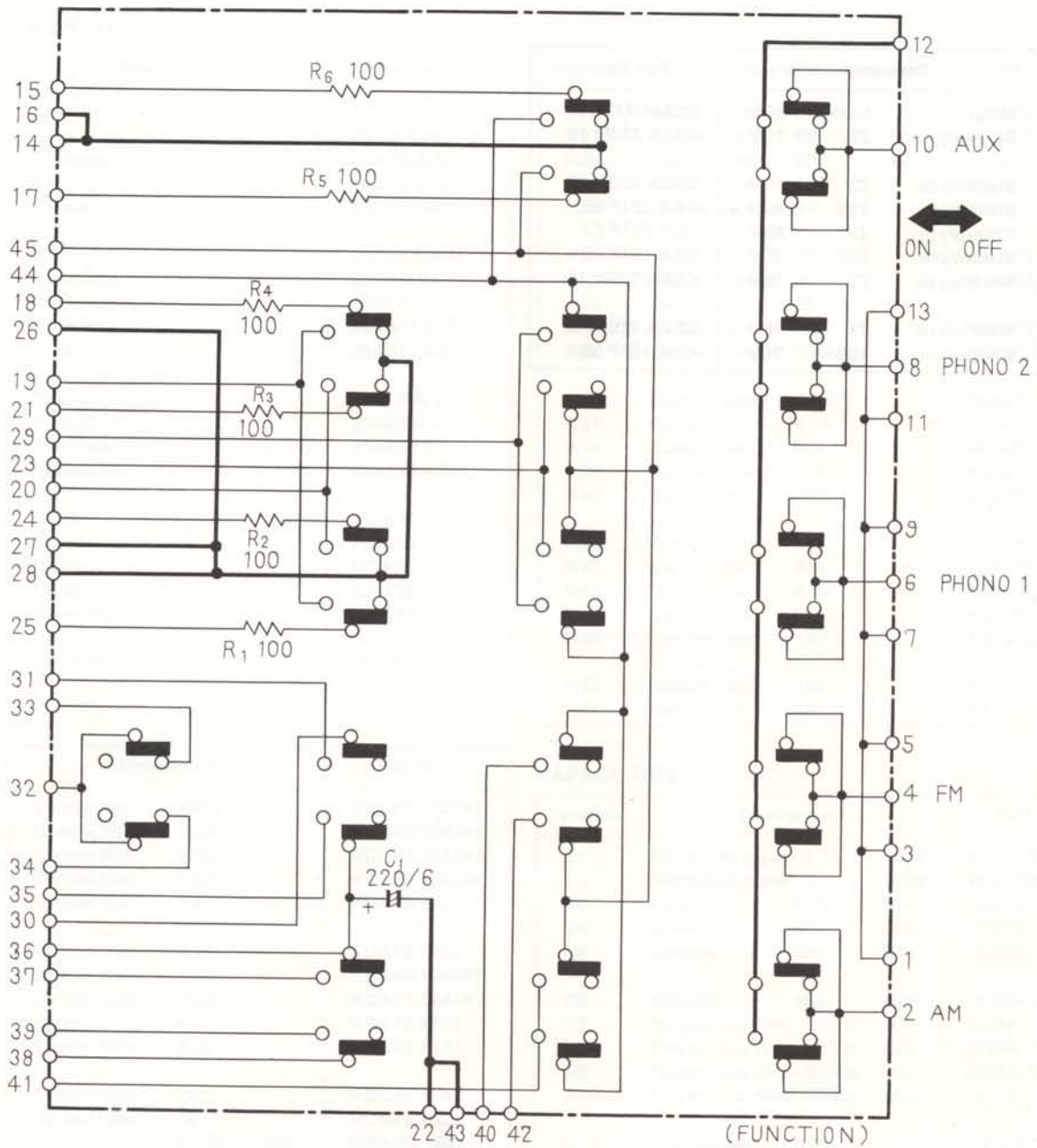
Symbol	Description	Part No.
R1	Carbon film 100k	RD½PS 104JNL
R2	Carbon film 100k	RD½PS 104JNL
R3	Carbon film 100k	RD½PS 104JNL
R4	Carbon film 100k	RD½PS 104JNL
R5	Carbon film 2.2k	RD½PS 222J
R6	Carbon film 2.2k	RD½PS 222J
R7	Carbon film 120k	RD½PS 124JNL
R8	Carbon film 120k	RD½PS 124JNL
R9	Carbon film 4.7k	RD½PS 472J
R10	Carbon film 4.7k	RD½PS 472J
R11	Carbon film 1k	RD½PS 102J
R12	Carbon film 1k	RD½PS 102J
R13	Metal film 1.54k ½W	RN½SR 1541F
R14	Metal film 1.54k ½W	RN½SR 1541F
R15	Metal film 75.0k ½W	RN½SR 7502F
R16	Metal film 75.0k ½W	RN½SR 7502F
R17	Metal film 910k ½W	RN½SR 9103F
R18	Metal film 910k ½W	RN½SR 9103F
R19	Carbon film 220	RD½PS 221J
R20	Carbon film 220	RD½PS 221J
R21	Carbon film 75k	RD½PS 753JNL
R22	Carbon film 75k	RD½PS 753JNL
R23	Carbon film 39k	RD½PS 393J
R24	Carbon film 39k	RD½PS 393J
R25	Carbon film 220	RD½PS 221J

CAPACITORS

Symbol	Description	Part No.
C1	Metallized mylar 1 100V	ACE-008
C2	Metallized mylar 1 100V	ACE-008
C3	Ceramic 47p 50V	CCDSL 470K 50
C4	Ceramic 47p 50V	CCDSL 470K 50
C5	Ceramic 68p 50V	CCDSL 680K 50
C6	Ceramic 68p 50V	CCDSL 680K 50
C7	Polystyrene film 1000p 50V	CQSA 102F 50
C8	Polystyrene film 1000p 50V	CQSA 102F 50
C9	Polystyrene film 3500p 50V	CQSA 352F 50
C10	Polystyrene film 3500p 50V	CQSA 352F 50
C11	Electrolytic 470 6V	CEA 471P 6
C12	Electrolytic 470 6V	CEA 471P 6
C13	Ceramic 27p 50V	CCDSL 270K 50
C14	Ceramic 27p 50V	CCDSL 270K 50
C15	Ceramic 10p 50V	CCDSL 100K 50
C16	Ceramic 10p 50V	CCDSL 100K 50
C17	Electrolytic 3.3 50V	CEANL 3R3P 50
C18	Electrolytic 3.3 50V	CEANL 3R3P 50
C19	Mylar 0.0018 50V	CQMA 182K 50
C20	Mylar 0.0018 50V	CQMA 182K 50
C21	Ceramic 470p 50V	CKDYB 471K 50
C22	Ceramic 470p 50V	CKDYB 471K 50
C23	Mylar 0.0047 50V	CQMA 472K 50

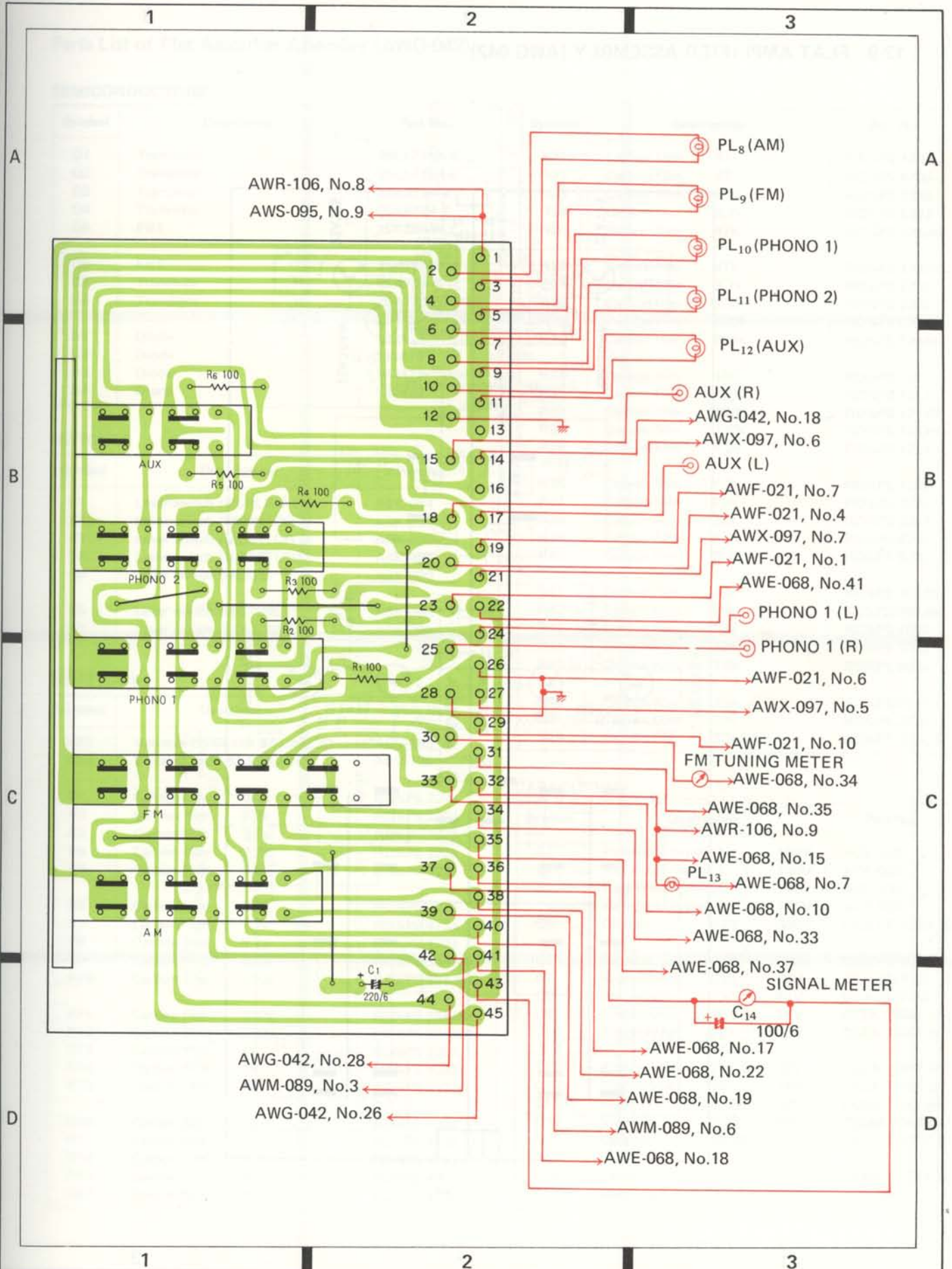
Symbol	Description			Part No.
C24	Mylar	0.0047	50V	CQMA 472K 50
C25	Electrolytic	22	16V	CSZA 220M 16
C26	Electrolytic	22	16V	CSZA 220M 16
C27	Electrolytic	220	63V	CEA 221P 63
C28	Electrolytic	220	63V	CEA 221P 63
C29	Electrolytic	100	35V	CEA 101P 35
C30	Electrolytic	22	16V	CSZA 220M 16
C31	Electrolytic	22	16V	CSZA 220M 16
C32	Electrolytic	100	35V	CEA 101P 35

12.8 FUNCTION SWITCH ASSEMBLY (AWS-094)



Parts List of Function Switch Assembly (AWS-094)

Symbol	Description	Part No.
S1	Push switch (FUNCTION)	ASG-095
R1	Carbon film resistor 100	RD¼PS 101J
R2	Carbon film resistor 100	RD¼PS 101J
R3	Carbon film resistor 100	RD¼PS 101J
R4	Carbon film resistor 100	RD¼PS 101J
R5	Carbon film resistor 100	RD¼PS 101J
R6	Carbon film resistor 100	RD¼PS 101J
C1	Electrolytic capacitor 220 6V	CEA 221P 6



AWR-106, No.8
AWS-095, No.9

PL₈ (AM)

PL₉ (FM)

PL₁₀ (PHONO 1)

PL₁₁ (PHONO 2)

PL₁₂ (AUX)

AUX (R)

AWG-042, No.18

AWX-097, No.6

AUX (L)

AWF-021, No.7

AWF-021, No.4

AWX-097, No.7

AWF-021, No.1

AWE-068, No.41

PHONO 1 (L)

PHONO 1 (R)

AWF-021, No.6

AWX-097, No.5

AWF-021, No.10

FM TUNING METER

AWE-068, No.34

AWE-068, No.35

AWR-106, No.9

AWE-068, No.15

PL₁₃ AWE-068, No.7

AWE-068, No.10

AWE-068, No.33

AWE-068, No.37

SIGNAL METER

AWE-068, No.17

AWE-068, No.22

AWE-068, No.19

AWM-089, No.6

AWE-068, No.18

AWG-042, No.28

AWM-089, No.3

AWG-042, No.26

C₁₄
100/6

C₁
220/5

R₆ 100

R₅ 100

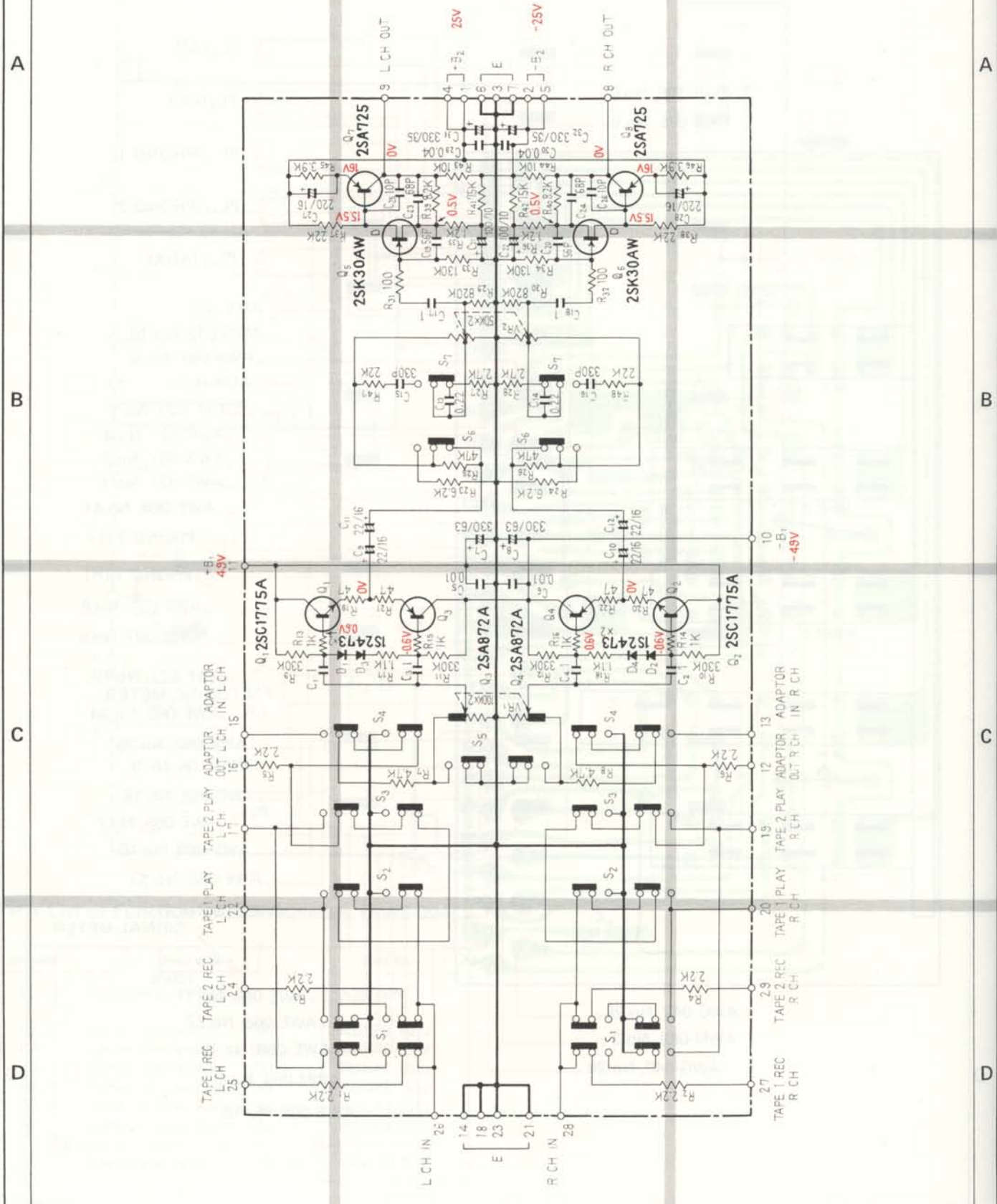
R₄ 100

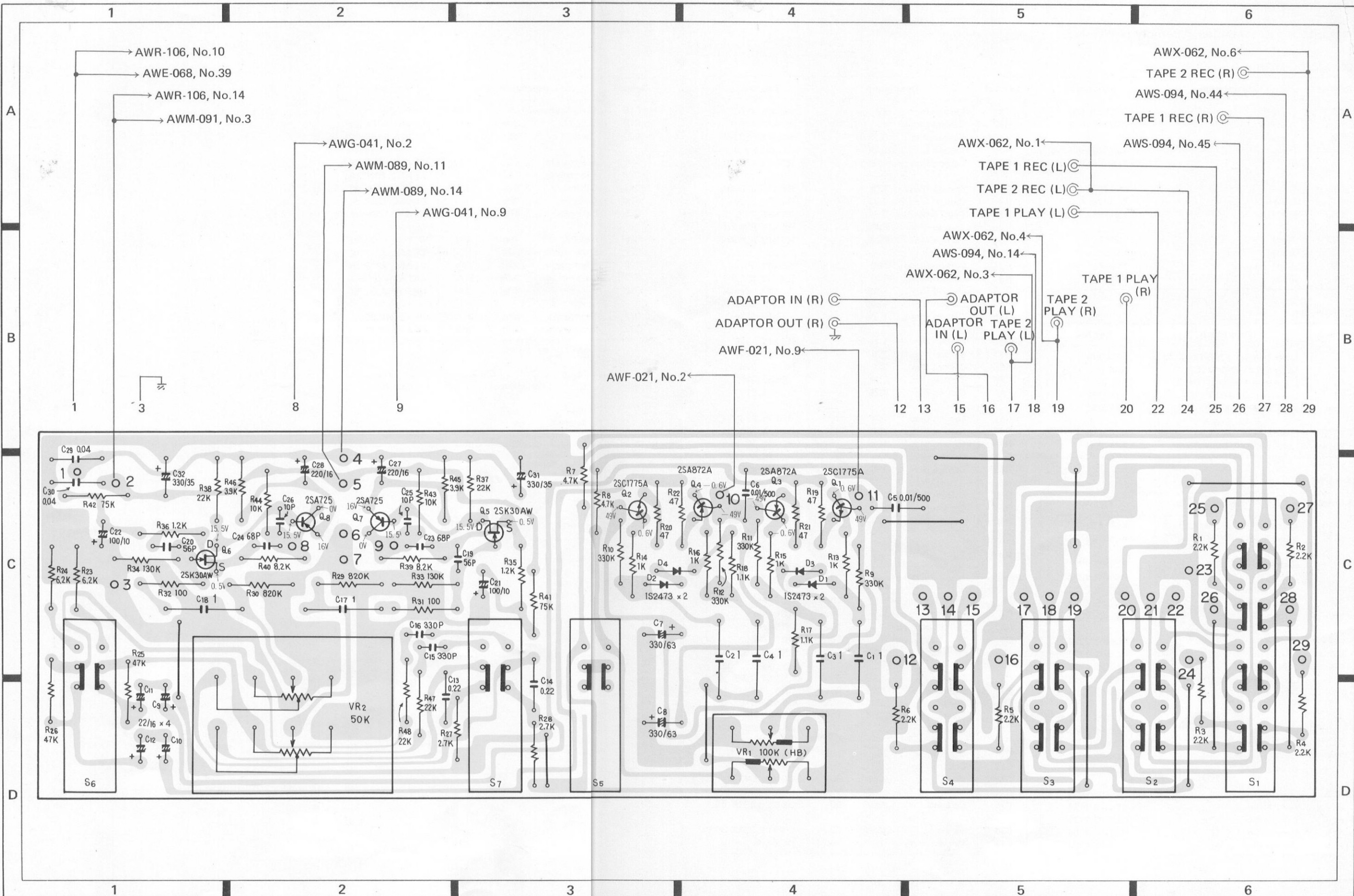
R₃ 100

R₂ 100

R₁ 100

12.9 FLAT AMPLIFIER ASSEMBLY (AWG-042)





Parts List of Flat Amplifier Assembly (AWG-042)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1775A-E
Q2	Transistor	2SC1775A-E
Q3	Transistor	2SA872A-E
Q4	Transistor	2SA872A-E
Q5	FET	2SK30AW-Y
Q6	FET	2SK30AW-Y
Q7	Transistor	2SA725-G
Q8	Transistor	2SA725-G
D1	Diode	1S2473
D2	Diode	1S2473
D3	Diode	1S2473
D4	Diode	1S2473

SWITCHES

Symbol	Description	Part No.
S1	Lever switch (DUPLICATE)	ASK-084
S2	Lever switch (MONITOR 1)	ASK-092
S3	Lever switch (MONITOR 2)	ASK-092
S4	Lever switch (ADAPTOR)	ASK-092
S5	Lever switch (MODE)	ASK-090
S6	Lever switch (MUTING)	ASK-090
S7	Lever switch (LOUDNESS)	ASK-090

RESISTORS

Symbol	Description	Part No.
VR1	Variable (100k-HB BALANCE)	ACV-163
VR2	Variable (50k-B2 VOLUME)	ACV-169
R1	Carbon film 2.2k	RD½PS 222J
R2	Carbon film 2.2k	RD½PS 222J
R3	Carbon film 2.2k	RD½PS 222J
R4	Carbon film 2.2k	RD½PS 222J
R5	Carbon film 2.2k	RD½PS 222J
R6	Carbon film 2.2k	RD½PS 222J
R7	Carbon film 4.7k	RD½PS 472J
R8	Carbon film 4.7k	RD½PS 472J
R9	Carbon film 330k	RD½PS 334JNL
R10	Carbon film 330k	RD½PS 334JNL
R11	Carbon film 330k	RD½PS 334JNL
R12	Carbon film 330k	RD½PS 334JNL
R13	Carbon film 1k	RD½PS 102J
R14	Carbon film 1k	RD½PS 102J
R15	Carbon film 1k	RD½PS 102J
R16	Carbon film 1k	RD½PS 102J
R17	Carbon film 1.1k	RD½PS 112J
R18	Carbon film 1.1k	RD½PS 112J
R19	Carbon film 47	RD½PS 470J
R20	Carbon film 47	RD½PS 470J

Symbol	Description	Part No.
R21	Carbon film 47	RD½PS 470J
R22	Carbon film 47	RD½PS 470J
R23	Carbon film 6.2k	RD½PS 622J
R24	Carbon film 6.2k	RD½PS 622J
R25	Carbon film 47k	RD½PS 473JNL
R26	Carbon film 47k	RD½PS 473JNL
R27	Carbon film 2.7k	RD½PS 272J
R28	Carbon film 2.7k	RD½PS 272J
R29	Carbon film 820k	RD½PS 824JNL
R30	Carbon film 820k	RD½PS 824JNL
R31	Carbon film 100	RD½PS 101J
R32	Carbon film 100	RD½PS 101J
R33	Carbon film 130k	RD½PS 134JNL
R34	Carbon film 130k	RD½PS 134JNL
R35	Carbon film 1.2k	RD½PS 122J
R36	Carbon film 1.2k	RD½PS 122J
R37	Carbon film 22k	RD½PS 223J
R38	Carbon film 22k	RD½PS 223J
R39	Carbon film 8.2k	RD½PS 822J
R40	Carbon film 8.2k	RD½PS 822J
R41	Carbon film 75k	RD½PS 753JNL
R42	Carbon film 75k	RD½PS 753JNL
R43	Carbon film 10k	RD½PS 103J
R44	Carbon film 10k	RD½PS 103J
R45	Carbon film 3.9k	RD½PS 392J
R46	Carbon film 3.9k	RD½PS 392J
R47	Carbon film 22k	RD½PS 223J
R48	Carbon film 22k	RD½PS 223J

CAPACITORS

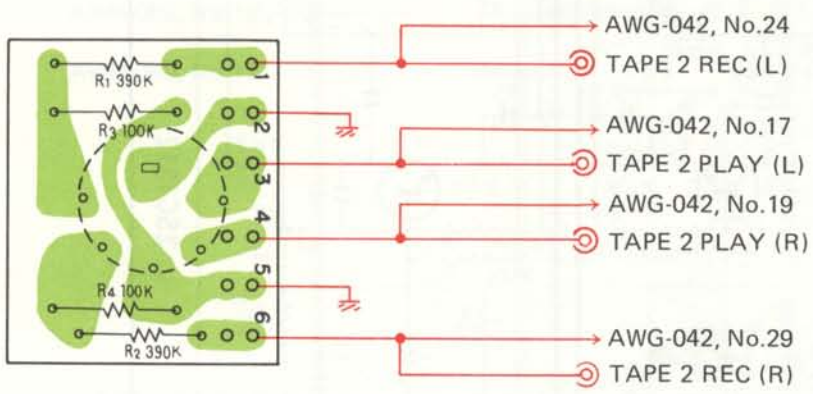
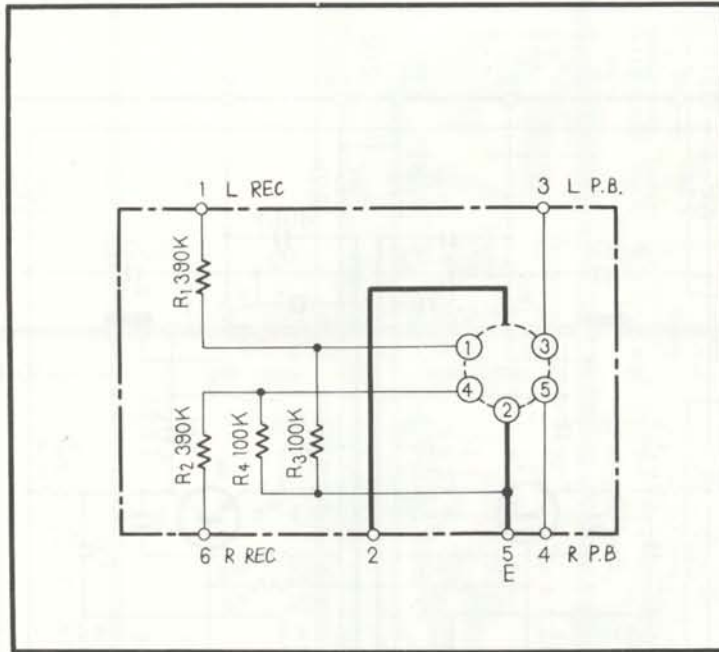
Symbol	Description	Part No.
C1	Metallized mylar 1 100V	ACE-008
C2	Metallized mylar 1 100V	ACE-008
C3	Metallized mylar 1 100V	ACE-008
C4	Metallized mylar 1 100V	ACE-008
C5	Ceramic 0.01 500V	CKDYF 103Z 500
C6	Ceramic 0.01 500V	CKDYF 103Z 500
C7	Electrolytic 330 63V	CEA 331P 63
C8	Electrolytic 330 63V	CEA 331P 63
C9	Electrolytic 22 16V	CSZA 220M 16
C10	Electrolytic 22 16V	CSZA 220M 16
C11	Electrolytic 22 16V	CSZA 220M 16
C12	Electrolytic 22 16V	CSZA 220M 16
C13	Mylar 0.22 50V	CQMA 224J 50
C14	Mylar 0.22 50V	CQMA 224J 50
C15	Ceramic 330R 50V	CKDYB 331K 50
C16	Ceramic 330p 50V	CKDYB 331K 50
C17	Metallized mylar 1 100V	ACE-008

Symbol	Description			Part No.
C18	Metallized mylar	1	100V	ACE-008
C19	Ceramic	56p	50V	CCDSL 560K 50
C20	Ceramic	56p	50V	CCDSL 560K 50
C21	Electrolytic	100	10V	CEANL 101P 10
C22	Electrolytic	100	10V	CEANL 101P 10
C23	Ceramic	68p	50V	CCDSL 680K 50
C24	Ceramic	68p	50V	CCDSL 680K 50
C25	Ceramic	10p	50V	CCDSL 100F 50
C26	Ceramic	10p	50V	CCDSL 100F 50
C27	Electrolytic	220	16V	CEANL 221P 16
C28	Electrolytic	220	16V	CEANL 221P 16
C29	Ceramic	0.04	50V	CKDYF 403Z 50
C30	Ceramic	0.04	50V	CKDYF 403Z 50
C31	Electrolytic	330	35V	CEA 331P 35
C32	Electrolytic	330	35V	CEA 331P 35

OTHERS

Symbol	Description	Part No.
	Screw	ABA-116
	Union nut	ABN-021
	Washer faced nut	ABN-024

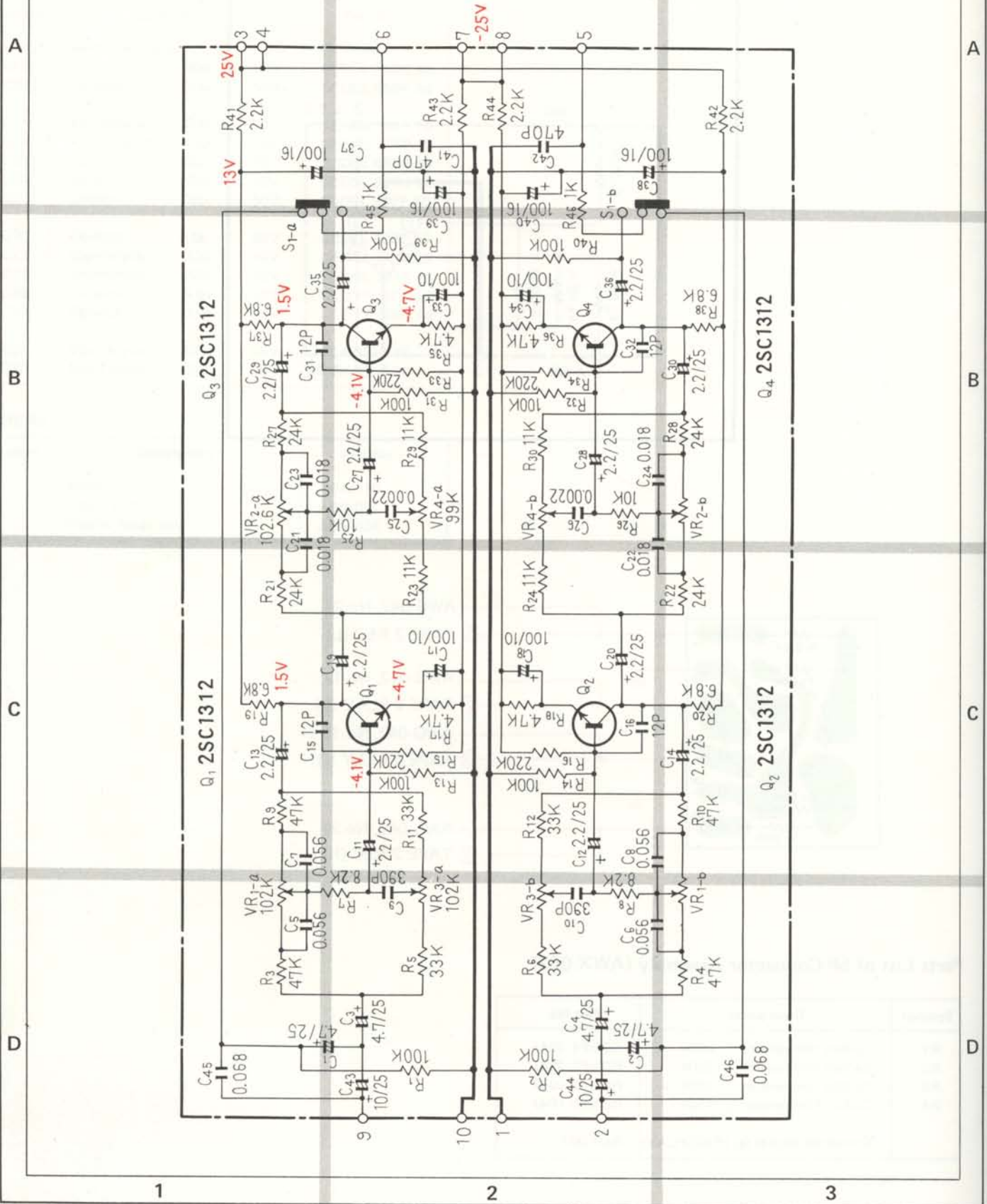
12.10 5P CONNECTOR ASSEMBLY (AWX-062)

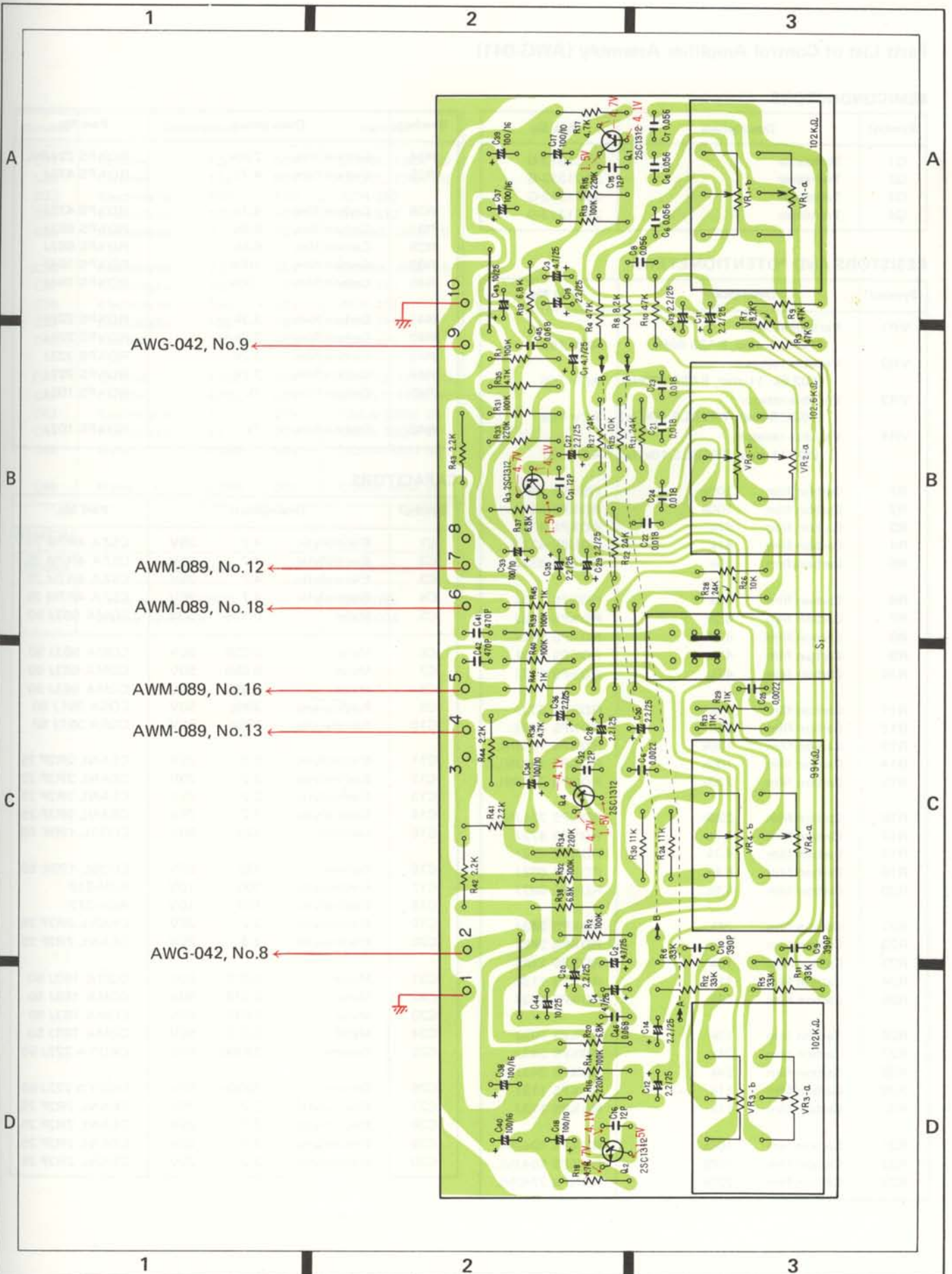


Parts List of 5P Connector Assembly (AWX-062)

Symbol	Description	Part No.
R1	Carbon film resistor 390k	RD¼PS 394J
R2	Carbon film resistor 390k	RD¼PS 394J
R3	Carbon film resistor 100k	RD¼PS 104J
R4	Carbon film resistor 100k	RD¼PS 104J
	Connector socket 5p (REC/PLAY)	AKP-007

12.11 CONTROL AMPLIFIER ASSEMBLY (AWG-041)





AWG-042, No.9

AWM-089, No.12

AWM-089, No.18

AWM-089, No.16

AWM-089, No.13

AWG-042, No.8

Parts List of Control Amplifier Assembly (AWG-041)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1312-G
Q2	Transistor	2SC1312-G
Q3	Transistor	2SC1312-G
Q4	Transistor	2SC1312-G

RESISTORS AND POTENTIOMETERS

Symbol	Description	Part No.
VR1	Variable resistor (102k, 5-step, BASS 50Hz)	ACV-165
VR2	Variable resistor (102.6k, 11-step, BASS 100Hz)	ACV-166
VR3	Variable resistor (102k, 5-step, TREBLE 20kHz)	ACV-168
VR4	Variable resistor (99k, 11-step, TREBLE 10kHz)	ACV-167
R1	Carbon film 100k	RD%PS 104J
R2	Carbon film 100k	RD%PS 104J
R3	Carbon film 47k	RD%PS 473J
R4	Carbon film 47k	RD%PS 473J
R5	Carbon film 33k	RD%PS 333J
R6	Carbon film 33k	RD%PS 333J
R7	Carbon film 8.2k	RD%PS 822J
R8	Carbon film 8.2k	RD%PS 822J
R9	Carbon film 47k	RD%PS 473J
R10	Carbon film 47k	RD%PS 473J
R11	Carbon film 33k	RD%PS 333J
R12	Carbon film 33k	RD%PS 333J
R13	Carbon film 100k	RD%PS 104JNL
R14	Carbon film 100k	RD%PS 104JNL
R15	Carbon film 220k	RD%PS 224JNL
R16	Carbon film 220k	RD%PS 224JNL
R17	Carbon film 4.7k	RD%PS 472J
R18	Carbon film 4.7k	RD%PS 472J
R19	Carbon film 6.8k	RD%PS 682J
R20	Carbon film 6.8k	RD%PS 682J
R21	Carbon film 24k	RD%PS 243J
R22	Carbon film 24k	RD%PS 243J
R23	Carbon film 11k	RD%PS 113J
R24	Carbon film 11k	RD%PS 113J
R25	Carbon film 10k	RD%PS 103J
R26	Carbon film 10k	RD%PS 103J
R27	Carbon film 24k	RD%PS 243J
R28	Carbon film 24k	RD%PS 243J
R29	Carbon film 11k	RD%PS 113J
R30	Carbon film 11k	RD%PS 113J
R31	Carbon film 100k	RD%PS 104JNL
R32	Carbon film 100k	RD%PS 104JNL
R33	Carbon film 220k	RD%PS 224JNL

Symbol	Description	Part No.
R34	Carbon film 220k	RD%PS 224JNL
R35	Carbon film 4.7k	RD%PS 472J
R36	Carbon film 4.7k	RD%PS 472J
R37	Carbon film 6.8k	RD%PS 682J
R38	Carbon film 6.8k	RD%PS 682J
R39	Carbon film 100k	RD%PS 104J
R40	Carbon film 100k	RD%PS 104J
R41	Carbon film 2.2k	RD%PS 222J
R42	Carbon film 2.2k	RD%PS 222J
R43	Carbon film 2.2k	RD%PS 222J
R44	Carbon film 2.2k	RD%PS 222J
R45	Carbon film 1k	RD%PS 102J
R46	Carbon film 1k	RD%PS 102J

CAPACITORS

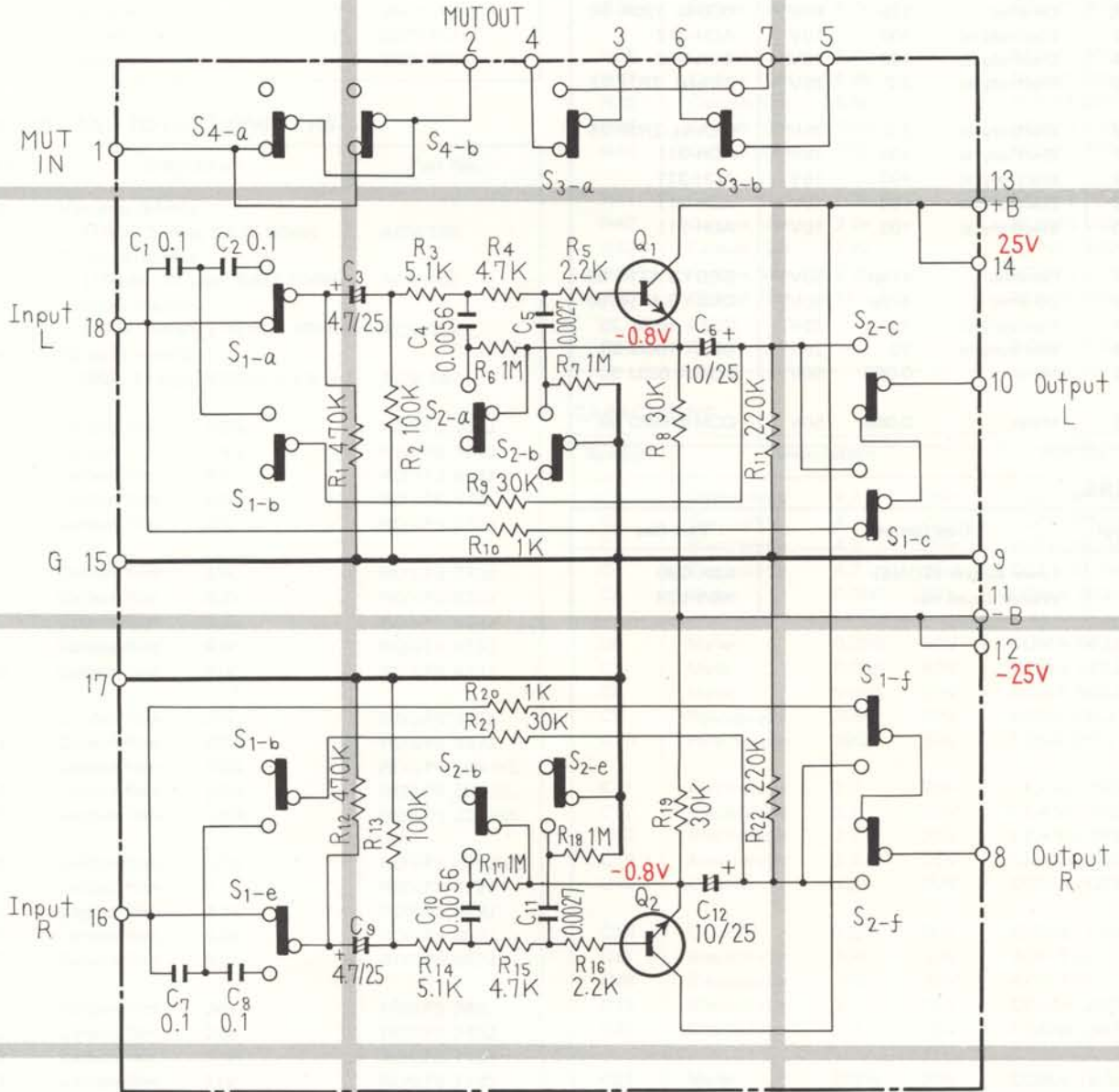
Symbol	Description	Part No.
C1	Electrolytic 4.7 25V	CSZA 4R7M 25
C2	Electrolytic 4.7 25V	CSZA 4R7M 25
C3	Electrolytic 4.7 25V	CSZA 4R7M 25
C4	Electrolytic 4.7 25V	CSZA 4R7M 25
C5	Mylar 0.056 50V	CQMA 563J 50
C6	Mylar 0.056 50V	CQMA 563J 50
C7	Mylar 0.056 50V	CQMA 563J 50
C8	Mylar 0.056 50V	CQMA 563J 50
C9	Polystyrene 390p 50V	CQSA 391J 50
C10	Polystyrene 390p 50V	CQSA 391J 50
C11	Electrolytic 2.2 25V	CEANL 2R2P 25
C12	Electrolytic 2.2 25V	CEANL 2R2P 25
C13	Electrolytic 2.2 25V	CEANL 2R2P 25
C14	Electrolytic 2.2 25V	CEANL 2R2P 25
C15	Ceramic 12p 50V	CCDSL 120K 50
C16	Ceramic 12p 50V	CCDSL 120K 50
C17	Electrolytic 100 10V	ACH-312
C18	Electrolytic 100 10V	ACH-312
C19	Electrolytic 2.2 25V	CEANL 2R2P 25
C20	Electrolytic 2.2 25V	CEANL 2R2P 25
C21	Mylar 0.018 50V	CQMA 183J 50
C22	Mylar 0.018 50V	CQMA 183J 50
C23	Mylar 0.018 50V	CQMA 183J 50
C24	Mylar 0.018 50V	CQMA 183J 50
C25	Ceramic 2200p 50V	CKDYA 222J 50
C26	Ceramic 2200p 50V	CKDYA 222J 50
C27	Electrolytic 2.2 25V	CEANL 2R2P 25
C28	Electrolytic 2.2 25V	CEANL 2R2P 25
C29	Electrolytic 2.2 25V	CEANL 2R2P 25
C30	Electrolytic 2.2 25V	CEANL 2R2P 25

Symbol	Description			Part No.
C31	Ceramic	12p	50V	CCDSL 120K 50
C32	Ceramic	12p	50V	CCDSL 120K 50
C33	Electrolytic	100	10V	ACH-312
C34	Electrolytic	100	10V	ACH-312
C35	Electrolytic	2.2	25V	CEANL 2R2P 25
C36	Electrolytic	2.2	25V	CEANL 2R2P 25
C37	Electrolytic	100	16V	ACH-311
C38	Electrolytic	100	16V	ACH-311
C39	Electrolytic	100	16V	ACH-311
C40	Electrolytic	100	16V	ACH-311
C41	Ceramic	470p	50V	CKDYB 471K 50
C42	Ceramic	470p	50V	CKDYB 471K 50
C43	Electrolytic	10	25V	CSZA 100M 25
C44	Electrolytic	10	25V	CSZA 100M 25
C45	Mylar	0.068	50V	CQMA 683J 50
C46	Mylar	0.068	50V	CQMA 683J 50

OTHERS

Symbol	Description	Part No.
	Lever switch (TONE)	ASK-090
	Washer faced nut	ABN-024

12.12 FILTER AMPLIFIER ASSEMBLY (AWM-089)

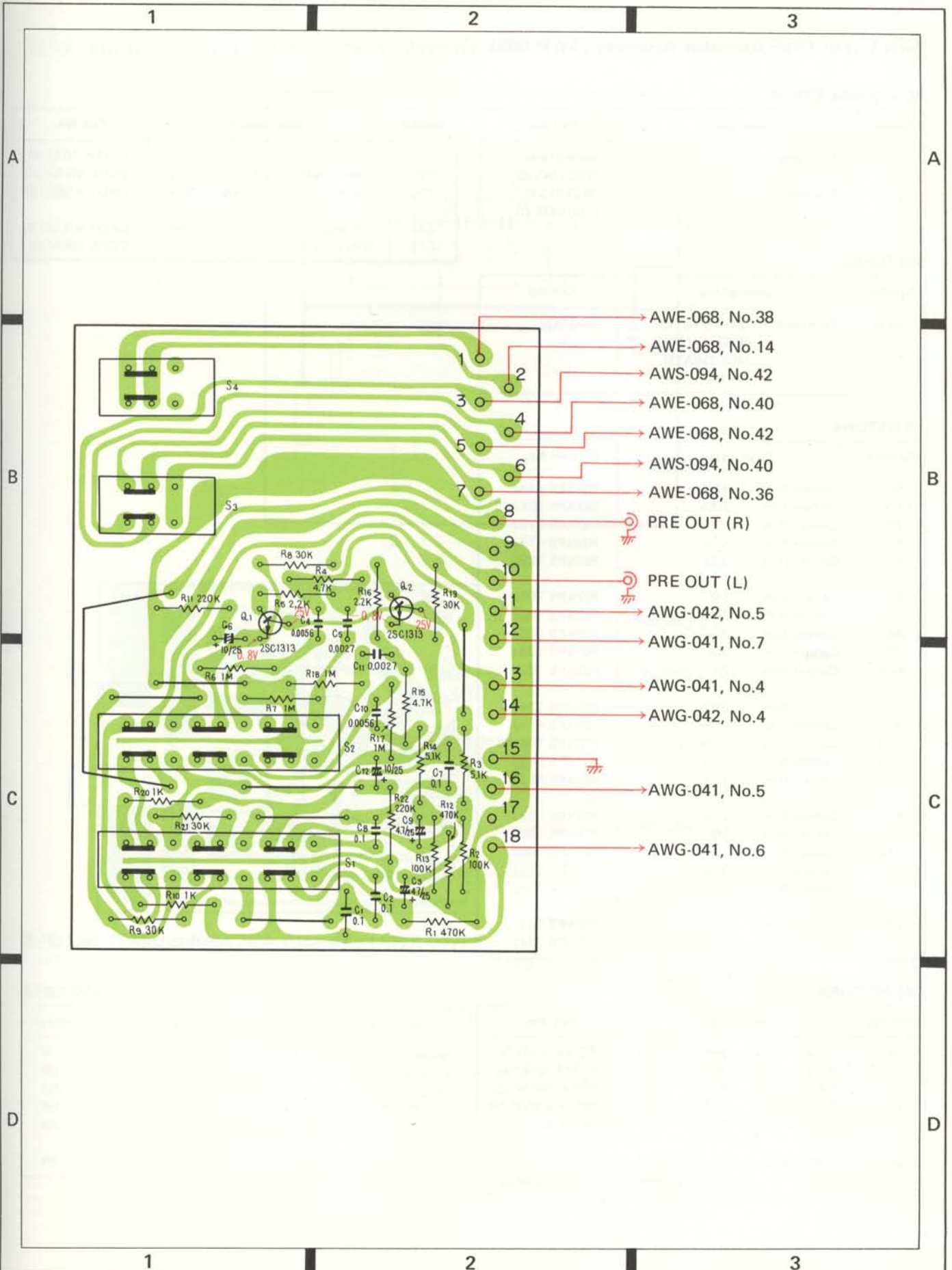


SWITCHES

- S₁ ; LOW FILTER
- S₂ ; HIGH FILTER
- S₃ ; MULTIPATH
- S₄ ; FM MUTING

TRANSISTORS

- Q₁, Q₂ **2SC1313**×2
(**2SC1345**)



Parts List of Filter Amplifier Assembly (AWM-089)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1313-G (2SC1345-D)
Q2	Transistor	2SC1313-G (2SC1345-D)

Symbol	Description	Part No.
C8	Mylar 0.1 50V	CQMA 104J 50
C9	Electrolytic 4.7 25V	CSZA 4R7M 25
C10	Ceramic 5600p 50V	CKDYA 562J 50
C11	Ceramic 2700p 50V	CKDYA 272J 50
C12	Electrolytic 10 25V	CSZA 100M 25

SWITCHES

Symbol	Description	Part No.
S1-4	Push switch (LOW FILTER, HIGH FILTER, MULTIPATH, FM MUTING)	ASG-098

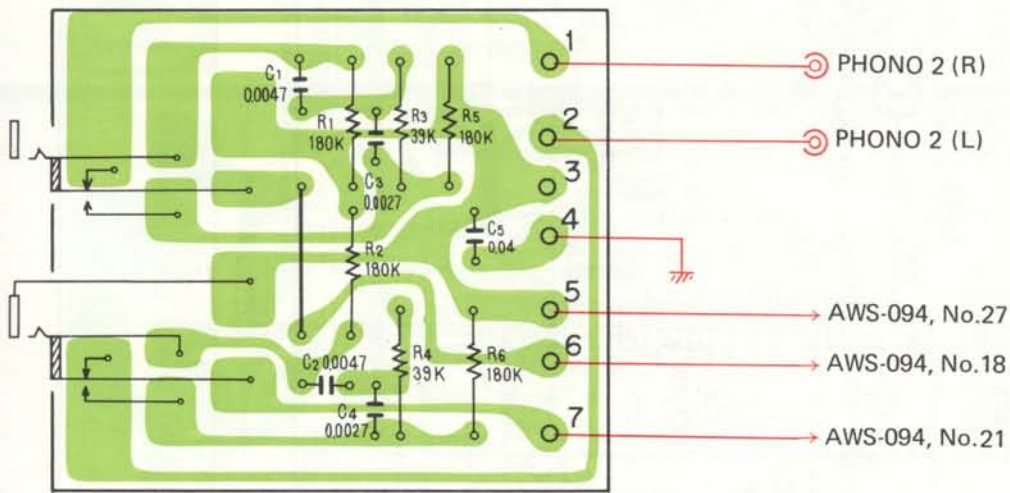
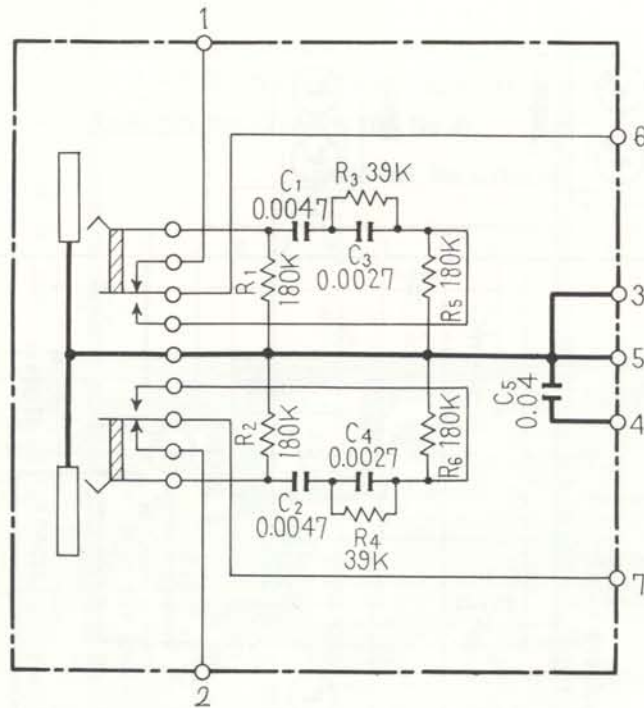
RESISTORS

Symbol	Description	Part No.
R1	Carbon film 470k	RD%PS 474J
R2	Carbon film 100k	RD%PS 104JNL
R3	Carbon film 5.1k	RD%PS 512J
R4	Carbon film 4.7k	RD%PS 472J
R5	Carbon film 2.2k	RD%PS 222J
R6	Carbon film 1M	RD%PS 105J
R7	Carbon film 1M	RD%PS 105J
R8	Carbon film 30k	RD%PS 303J
R9	Carbon film 30k	RD%PS 303J
R10	Carbon film 1k	RD%PS 102J
R11	Carbon film 220k	RD%PS 224J
R12	Carbon film 470k	RD%PS 474J
R13	Carbon film 100k	RD%PS 104JNL
R14	Carbon film 5.1k	RD%PS 512J
R15	Carbon film 4.7k	RD%PS 472J
R16	Carbon film 2.2k	RD%PS 222J
R17	Carbon film 1M	RD%PS 105J
R18	Carbon film 1M	RD%PS 105J
R19	Carbon film 30k	RD%PS 303J
R20	Carbon film 1k	RD%PS 102J
R21	Carbon film 30k	RD%PS 303J
R22	Carbon film 220k	RD%PS 224J

CAPACITORS

Symbol	Description	Part No.
C1	Mylar 0.1 50V	CQMA 104J 50
C2	Mylar 0.1 50V	CQMA 104J 50
C3	Electrolytic 4.7 25V	CSZA 4R7M 25
C4	Ceramic 5600p 50V	CKDYA 562J 50
C5	Ceramic 2700p 50V	CKDYA 272J 50
C6	Electrolytic 10 25V	CSZA 100M 25
C7	Mylar 0.1 50V	CQMA 104J 50

12.13 MICROPHONE JACK ASSEMBLY (AWX-097)



Parts List of Microphone Jack Assembly (AWX-097)

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 180k	RD¼PS 184JNL
R2	Carbon film 180k	RD¼PS 184JNL
R3	Carbon film 39k	RD¼PS 393JNL
R4	Carbon film 39k	RD¼PS 393JNL
R5	Carbon film 180k	RD¼PS 184JNL
R6	Carbon film 180k	RD¼PS 184JNL

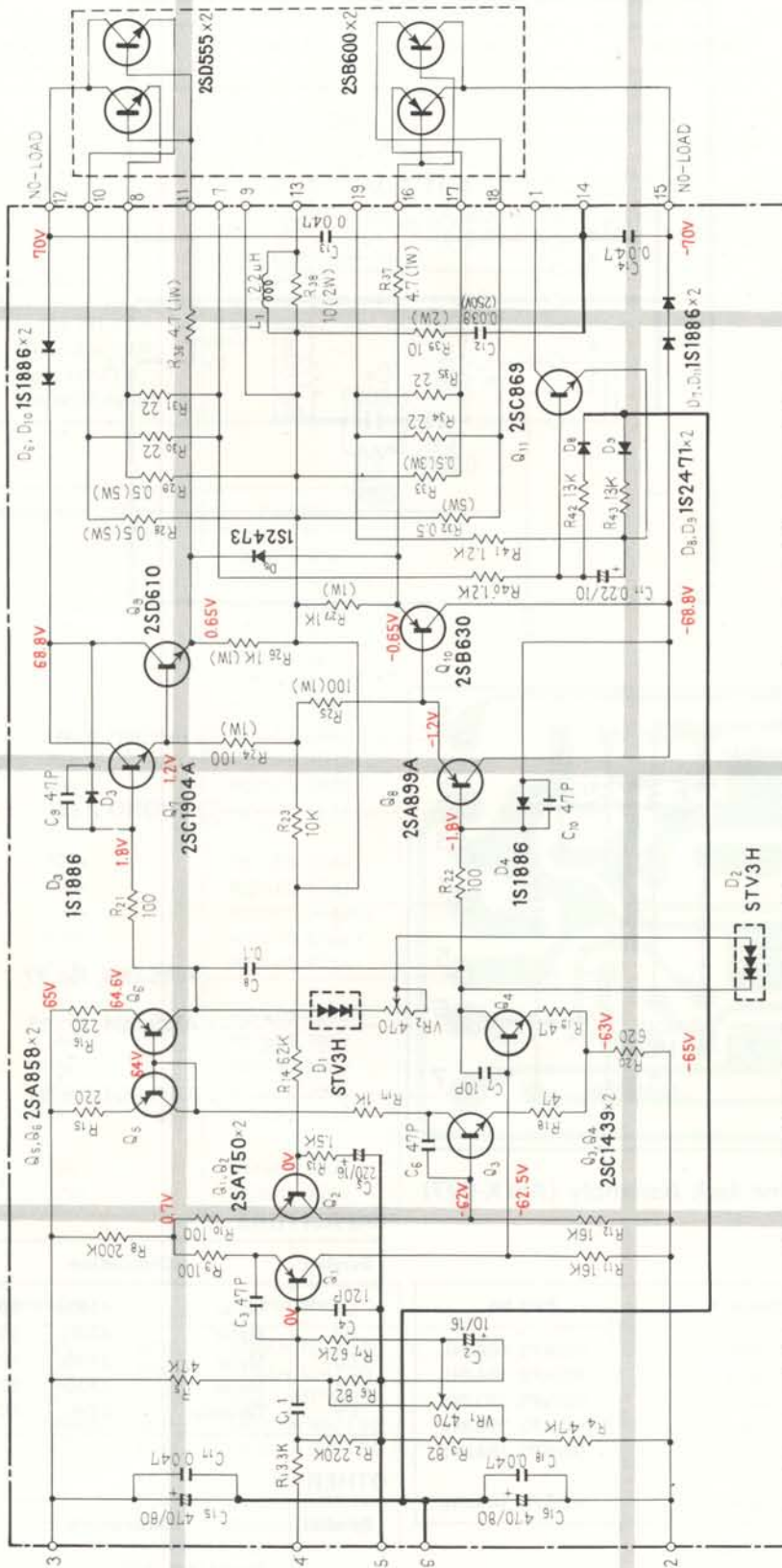
CAPACITORS

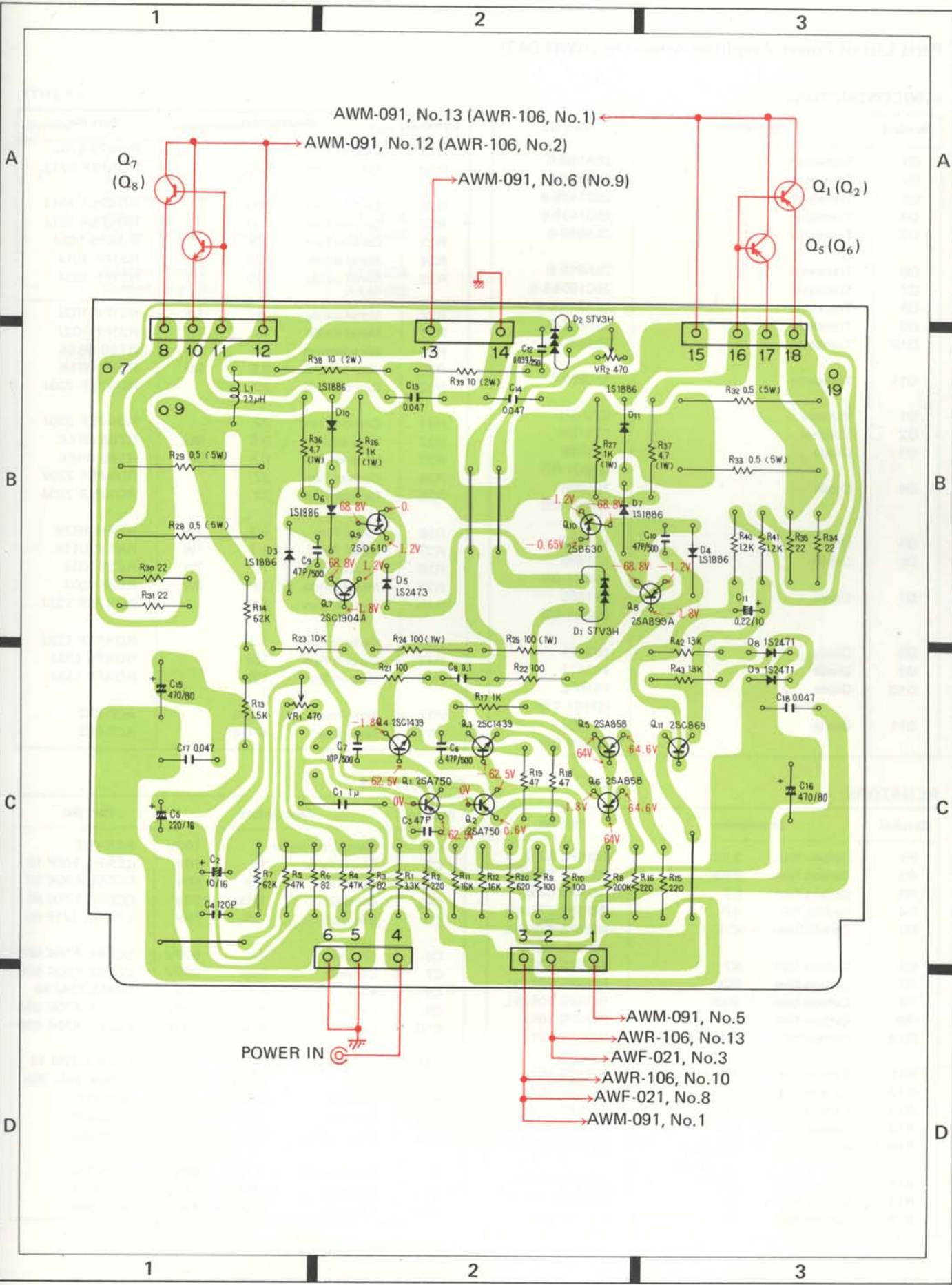
Symbol	Description	Part No.
C1	Mylar 4700p 50V	CQMA 472J 50
C2	Mylar 4700p 50V	CQMA 472J 50
C3	Mylar 2700p 50V	CQMA 272J 50
C4	Mylar 2700p 50V	CQMA 272J 50
C5	Ceramic 0.04 50V	CKDYF 403Z 50

OTHER

Symbol	Description	Part No.
	Phone jack (MIC)	AKN-013

12.14 POWER AMPLIFIER ASSEMBLY (AWH-048)





POWER IN

- AWM-091, No.5
- AWR-106, No.13
- AWF-021, No.3
- AWR-106, No.10
- AWF-021, No.8
- AWM-091, No.1

Parts List of Power Amplifier Assembly (AWH-048)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SA750-E
Q2	Transistor	2SA750-E
Q3	Transistor	2SC1439-B
Q4	Transistor	2SC1439-B
Q5	Transistor	2SA858-B
Q6	Transistor	2SA858-B
Q7	Transistor	2SC1904A-B
Q8	Transistor	2SA899A-B
Q9	Transistor	2SD610-R
Q10	Transistor	2SB630-R
Q11	Transistor	2SC869-C
D1	Varistor	STV-3H
D2	Varistor	STV-3H
D3	Diode	1S1886 (SIB01-02)
D4	Diode	1S1886 (SIB01-02)
D5	Diode	1S2473
D6	Diode	1S1886 (SIB01-02)
D7	Diode	1S1886 (SIB01-02)
D8	Diode	1S2471
D9	Diode	1S2471
D10	Diode	1S1886 (SIB01-02)
D11	Diode	1S1886 (SIB01-02)

Symbol	Description	Part No.
R19	Carbon film	47 RD¼PS 470J
R20	Carbon film	620 RD¼PSF 621J
R21	Carbon film	100 RD¼PSF 101J
R22	Carbon film	100 RD¼PSF 101J
R23	Carbon film	10k RD¼PS 103J
R24	Metal oxide	100 1W RS1PF 101J
R25	Metal oxide	100 1W RS1PF 101J
R26	Metal oxide	1k 1W RS1PF 102J
R27	Metal oxide	1k 1W RS1PF 102J
R28	Wire wound	0.5 5W RT5B 0R5K
R29	Wire wound	0.5 5W RT5B 0R5K
R30	Carbon film	22 RD¼PSF 220J
R31	Carbon film	22 RD¼PSF 220J
R32	Wire sound	0.5 5W RT5B 0R5K
R33	Wire wound	0.5 5W RT5B 0R5K
R34	Carbon film	22 RD¼PSF 220J
R35	Carbon film	22 RD¼PSF 220J
R36	Metal film	4.7 1W RN1H 4R7K
R37	Metal film	4.7 1W RN1H 4R7K
R38	Metal oxide	10 2W RS2P 100J
R39	Metal oxide	10 2W RS2P 100J
R40	Carbon film	1.2k RD¼PSF 122J
R41	Carbon film	1.2k RD¼PSF 122J
R42	Carbon film	13k RD¼PS 133J
R43	Carbon film	13k RD¼PS 133J
VR1	Semi-fixed	470-B ACP-033
VR2	Semi-fixed	470-B ACP-033

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 3.3k	RD¼PS 332J
R2	Carbon film 220k	RD¼PS 224JNL
R3	Carbon film 82	RD¼PS 820J
R4	Carbon film 47k	RD¼PS 473JNL
R5	Carbon film 47k	RD¼PS 473JNL
R6	Carbon film 82	RD¼PS 820J
R7	Carbon film 62k	RD¼PS 623JNL
R8	Carbon film 200k	RD¼PS 204JNL
R9	Carbon film 100	RD¼PS 101J
R10	Carbon film 100	RD¼PS 101J
R11	Carbon film 16k	RD¼PS 163J
R12	Carbon film 16k	RD¼PS 163J
R13	Carbon film 1.5k	RD¼PS 152J
R14	Carbon film 62k	RD¼PS 623JNL
R15	Carbon film 220	RD¼PSF 221J
R16	Carbon film 220	RD¼PSF 221J
R17	Carbon film 1k	RD¼PSF 102J
R18	Carbon film 47	RD¼PS 470J

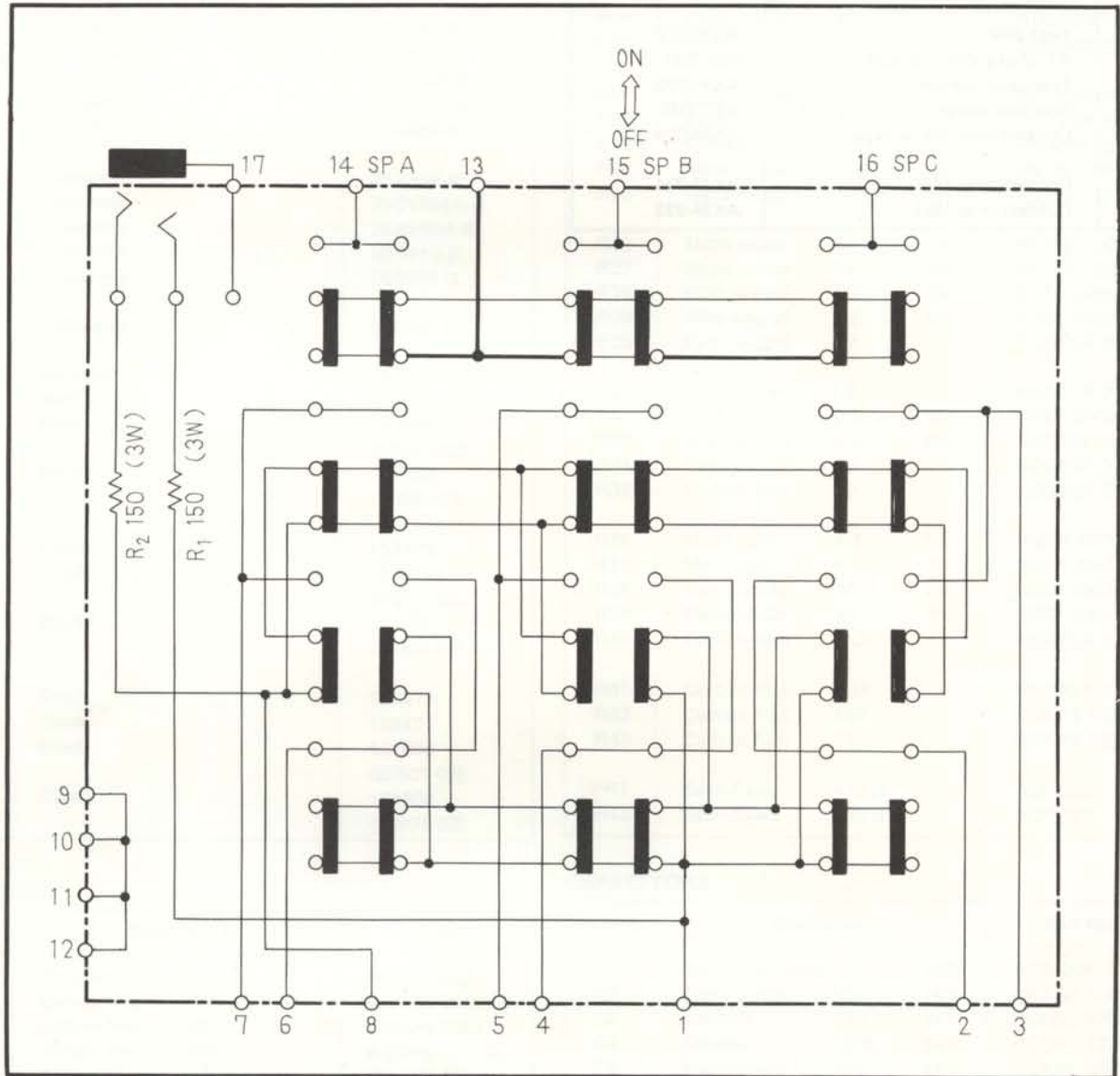
CAPACITORS

Symbol	Description	Part No.
C1	Metallized mylar 1 100V	ACE-008
C2	Electrolytic 10 16V	CEANL 100P 16
C3	Ceramic 47p 50V	CCDSL 470K 50
C4	Ceramic 120p 50V	CCDSL 121K 50
C5	Electrolytic 220 16V	CEANL 221P 16
C6	Ceramic 47p 500V	CCDSL 470K 500
C7	Ceramic 10p 500V	CCDSL 100K 500
C8	Mylar 0.1 50V	CQMA 104J 50
C9	Ceramic 47p 500V	CCDSL 470K 500
C10	Ceramic 47p 500V	CCDSL 470K 500
C11	Electrolytic 0.22 10V	CSZA R22M 10
C12	Mylar 0.039 250V	CQMA 393J 250
C13	Ceramic 0.047 150V	ACG-009
C14	Ceramic 0.047 150V	ACG-009
C15	Electrolytic 470 80V	ACH-038
C16	Electrolytic 470 80V	ACH-038
C17	Ceramic 0.047 150V	ACG-009
C18	Ceramic 0.047 150V	ACG-009

OTHERS

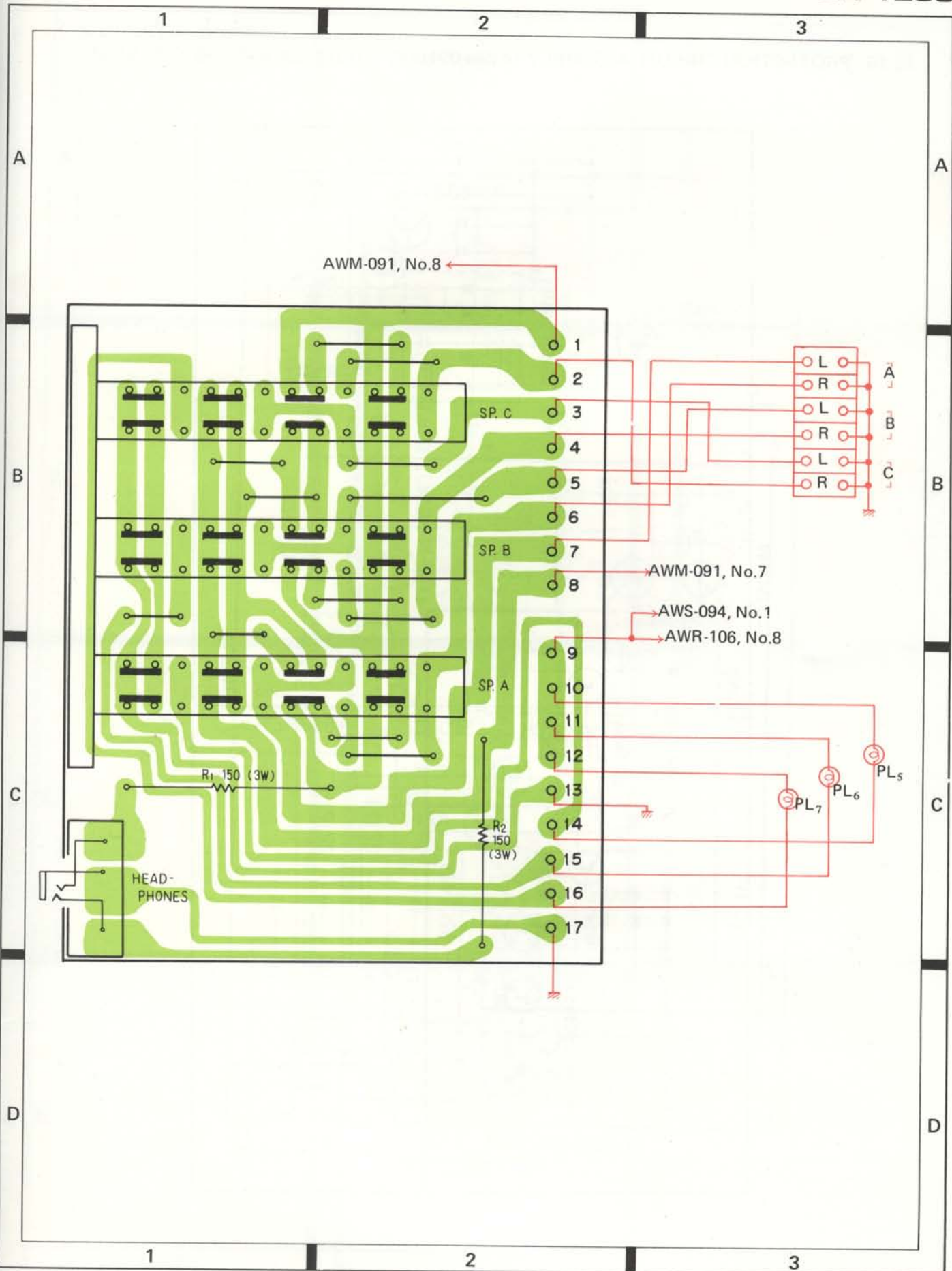
Symbol	Description	Part No.
L1	Heat sink	ANH-237
	AF choke coil 2.2 μ H	T63-009
	Transistor socket	AKH-002
	Insulator wafer	AEC-088
	Contact strip (3p, L-type)	AKM-024
	Contact strip (4p)	AKM-034
	Contact strip (3p)	AKM-033

12.15 SPEAKERS SWITCH ASSEMBLY (AWS-095)

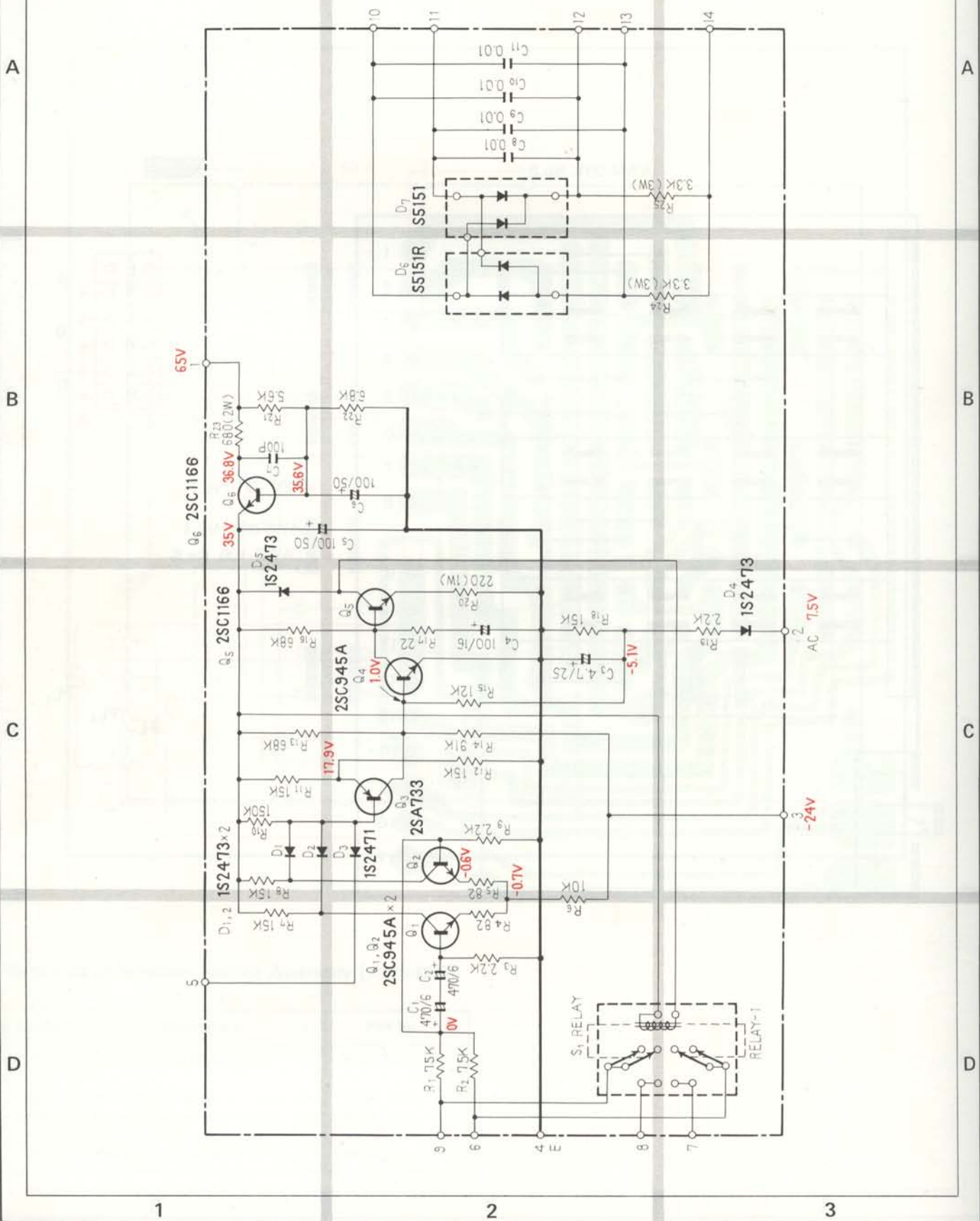


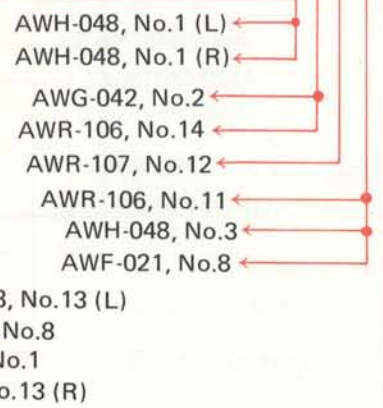
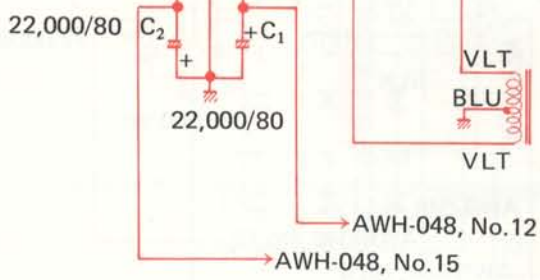
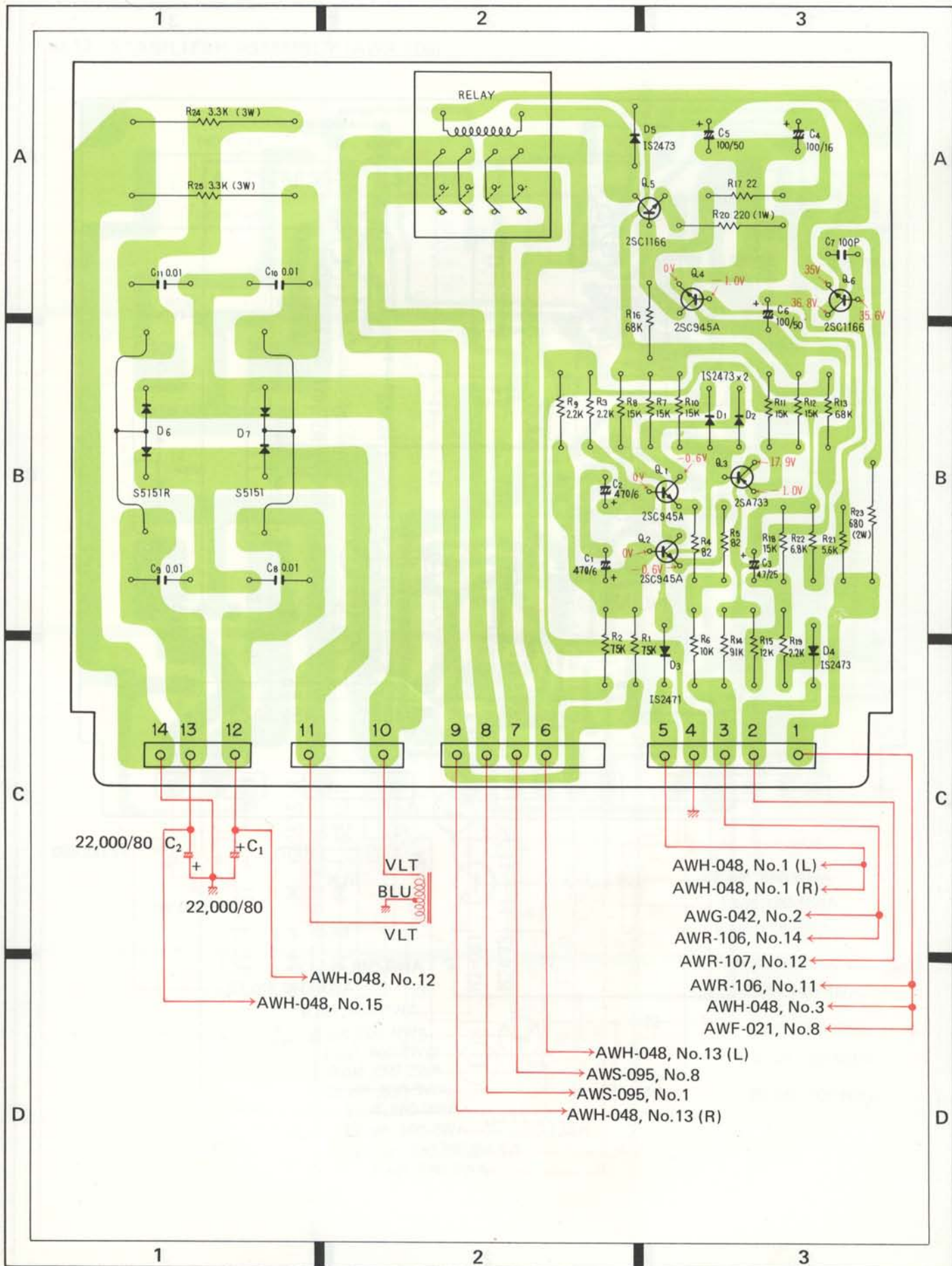
Parts List of Speakers Switch Assembly (AWS-095)

Symbol	Description	Part No.
S1	Push switch (SPEAKERS)	ASG-094
R1	Metal oxide resistor 150 3W	RS3P 151K
R2	Metal oxide resistor 150 3W	RS3P 151K
J1	Phone jack (PHONES)	AKN-010



12.16 PROTECTION CIRCUIT ASSEMBLY (AWM-091)





Parts List of Protection Circuit Assembly (AWM-091)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC945A-Q (2SC1647-P)
Q2	Transistor	2SC945A-Q (2SC1647-P)
Q3	Transistor	2SA733-Q
Q4	Transistor	2SC945A-Q (2SC1647-P)
Q5	Transistor	2SC1166-Y (2SC1384-Q)
Q6	Transistor	2SC1166-Y (2SC1384-Q)
D1	Diode	1S2473
D2	Diode	1S2473
D3	Diode	1S2471
D4	Diode	1S2473
D5	Diode	1S2473
D6	Diode	S5151R
D7	Diode	S5151

CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic 470 6V	CEA 471P 6
C2	Electrolytic 470 6V	CEA 471P 6
C3	Electrolytic 4.7 25V	CEA 4R7P 25
C4	Electrolytic 100 16V	CEA 101P 16
C5	Electrolytic 100 50V	CEA 101P 50
C6	Electrolytic 100 50V	CEA 101P 50
C7	Ceramic 100p 50V	CCDSL 101K 50
C8	Ceramic 0.01 150V	ACG-004
C9	Ceramic 0.01 150V	ACG-004
C10	Ceramic 0.01 150V	ACG-004
C11	Ceramic 0.01 150V	ACG-004

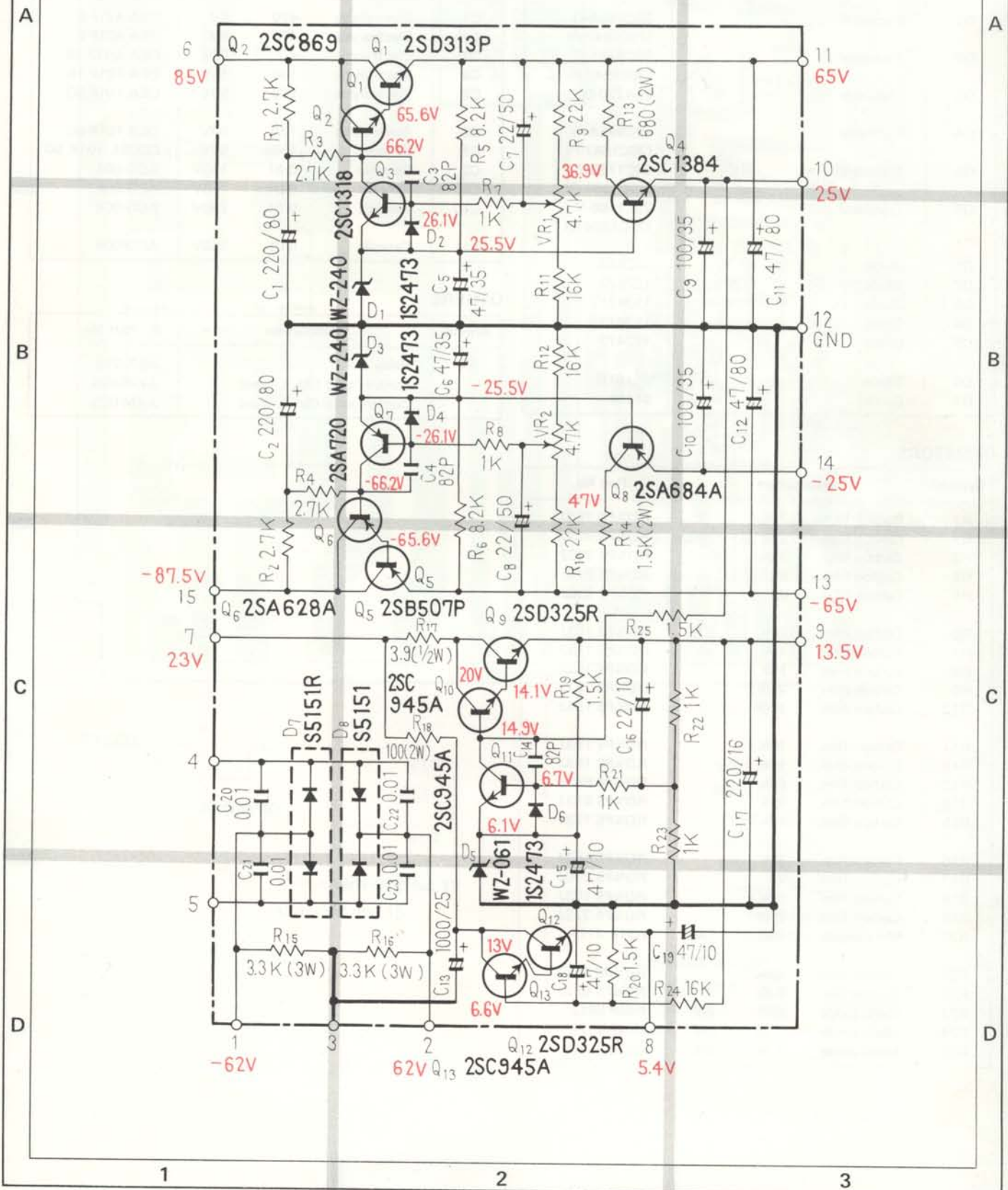
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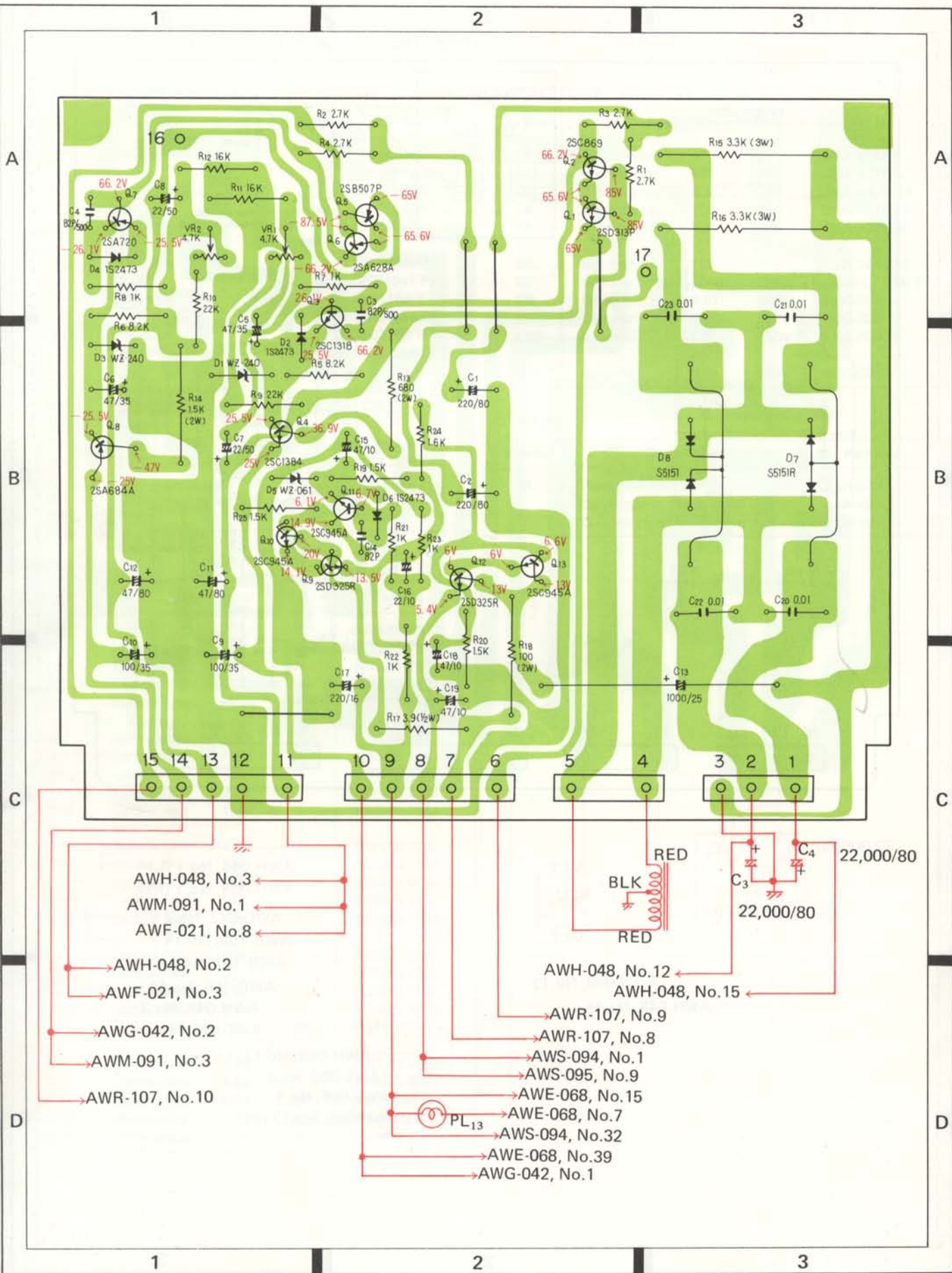
Symbol	Description	Part No.
S1	Relay Contact strip (3p, L-type) Contact strip (5p, L-type)	ASR-010 AKM-024 AKM-025

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 75k	RD4PS 753J
R2	Carbon film 75k	RD4PS 753J
R3	Carbon film 2.2k	RD4PS 222J
R4	Carbon film 82	RD4PS 820J
R5	Carbon film 82	RD4PS 820J
R6	Carbon film 10k	RD4PS 103J
R7	Carbon film 15k	RD4PS 153J
R8	Carbon film 15k	RD4PS 153J
R9	Carbon film 2.2k	RD4PS 222J
R10	Carbon film 150k	RD4PS 154J
R11	Carbon film 15k	RD4PS 153J
R12	Carbon film 15k	RD4PS 153J
R13	Carbon film 68k	RD4PS 683J
R14	Carbon film 91k	RD4PS 913J
R15	Carbon film 12k	RD4PS 123J
R16	Carbon film 68k	RD4PS 683J
R17	Carbon film 22	RD4PS 220J
R18	Carbon film 15k	RD4PS 153J
R19	Carbon film 2.2k	RD4PS 222J
R20	Metal oxide 220 1W	RS1P 211J
R21	Carbon film 5.6k	RD4PS 562J
R22	Carbon film 6.8k	RD4PS 682J
R23	Metal oxide 680 2W	RS2P 681J
R24	Metal oxide 3.3k 3W	RS3P 332K
R25	Metal oxide 3.3k 3W	RS3P 332K

12.17 STABILIZER ASSEMBLY (AWR-106)

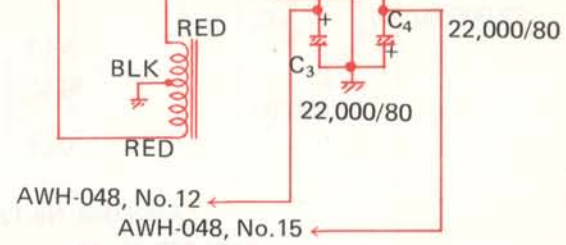




- AWH-048, No.3
- AWM-091, No.1
- AWF-021, No.8

- AWH-048, No.2
- AWF-021, No.3
- AWG-042, No.2
- AWM-091, No.3
- AWR-107, No.10

- PL₁₃
- AWE-068, No.15
- AWE-068, No.7
- AWS-094, No.32
- AWE-068, No.39
- AWG-042, No.1



- AWH-048, No.12
- AWH-048, No.15
- AWR-107, No.9
- AWR-107, No.8
- AWS-094, No.1
- AWS-095, No.9

Parts List of Stabilizer Assembly (AWR-106)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SD313P-E
Q2	Transistor	2SC869-D
Q3	Transistor	2SC1318-R
Q4	Transistor	2SC1384-R
Q5	Transistor	2SB507P-E
Q6	Transistor	2SA628A-D
Q7	Transistor	2SA720-R
Q8	Transistor	2SA684A-R
Q9	Transistor	2SD325R-E
Q10	Transistor	2SC945A-R
Q11	Transistor	2SC945A-R
Q12	Transistor	2SD325R-E
Q13	Transistor	2SC945A-R
D1	Zener diode	WZ-240
D2	Diode	1S2473
D3	Zener diode	WZ-240
D4	Diode	1S2473
D5	Zener diode	WZ-061
D6	Diode	1S2473
D7	Diode	S5151R
D8	Diode	S5151

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 2.7k	RD¼PSF 272J
R2	Carbon film 2.7k	RD¼PSF 272J
R3	Carbon film 2.7k	RD¼PS 272J
R4	Carbon film 2.7k	RD¼PS 272J
R5	Carbon film 8.2k	RD¼PS 822J
R6	Carbon film 8.2k	RD¼PS 822J
R7	Carbon film 1k	RD¼PS 102J
R8	Carbon film 1k	RD¼PS 102J
R9	Carbon film 22k	RD¼PS 223J
R10	Carbon film 22k	RD¼PS 223J
R11	Carbon film 16k	RD¼PS 163J
R12	Carbon film 16k	RD¼PS 163J
R13	Metal oxide 680 2W	RS2P 681K
R14	Metal oxide 1.5k 2W	RS2P 152K
R15	Metal oxide 3.3k 3W	RS3P 332K
R16	Metal oxide 3.3k 3W	RS3P 332K
R17	Carbon film 3.9 ½W	RD¼PSF 3R9J
R18	Metal oxide 100 2W	RS2P 101K
R19	Carbon film 1.5k	RD¼PS 152J
R20	Carbon film 1.5k	RD¼PS 152J
R21	Carbon film 1k	RD¼PS 102J
R22	Carbon film 1k	RD¼PS 102J
R23	Carbon film 1k	RD¼PS 102J

Symbol	Description	Part No.
R24	Carbon film 1.6k	RD¼PS 162J
R25	Carbon film 1.5k	RD¼PS 152J
VR1	Semi-fixed 4.7k-B	ACP-034
VR2	Semi-fixed 4.7k-B	ACP-034

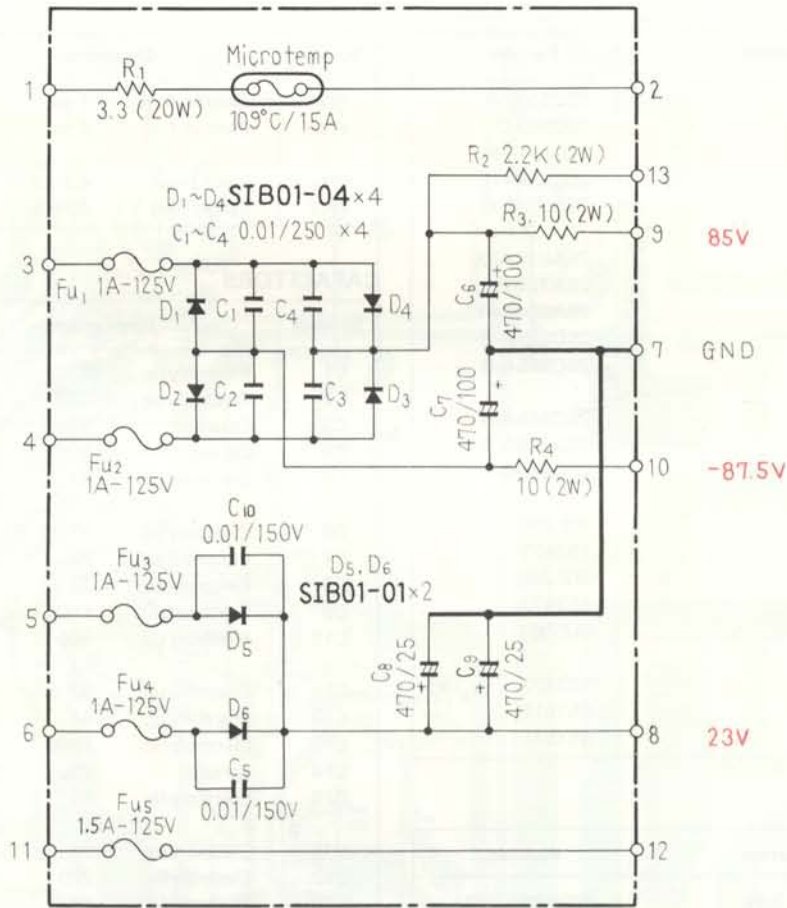
CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic 220 80V	CEA 221P 80
C2	Electrolytic 220 80V	CEA 221P 80
C3	Ceramic 82p 500V	CCDSL 820K 500
C4	Ceramic 82p 500V	CCDSL 820K 500
C5	Electrolytic 47 35V	CEA 470P 35
C6	Electrolytic 47 35V	CEA 470P 35
C7	Electrolytic 22 50V	CEA 220P 50
C8	Electrolytic 22 50V	CEA 220P 50
C9	Electrolytic 100 35V	CEA 101P 35
C10	Electrolytic 100 35V	CEA 101P 35
C11	Electrolytic 47 80V	CEA 470P 80
C12	Electrolytic 47 80V	CEA 470P 80
C13	Electrolytic 1000 25V	CEB 102P 25
C14	Ceramic 82p 50V	CCDSL 820K 50
C15	Electrolytic 47 10V	CEA 470P 10
C16	Electrolytic 22 10V	CEA 220P 10
C17	Electrolytic 220 16V	CEA 221P 16
C18	Electrolytic 47 10V	CEA 470P 10
C19	Electrolytic 47 10V	CEA 470P 10
C20	Ceramic 0.01 150V	ACG-004
C21	Ceramic 0.01 150V	ACG-004
C22	Ceramic 0.01 150V	ACG-004
C23	Ceramic 0.01 150V	ACG-004

OTHERS

Symbol	Description	Part No.
	Heat sink	ANH-237
	Heat sink	ANH-300
	Transistor socket	AKH-002
	Insulator wafer	ACE-088
	Contact strip (3p, L-type)	AKM-024
	Contact strip (5p, L-type)	AKM-025

12.18 POWER SUPPLY ASSEMBLY (AWR-107)



Parts List of Power Supply Assembly (AWR-107)

SEMICONDUCTORS

Symbol	Description	Part No.
D1	Diode	SIB01-04
D2	Diode	SIB01-04
D3	Diode	SIB01-04
D4	Diode	SIB01-04
D5	Diode	SIB01-01 (1S1885)
D6	Diode	SIB01-01 (1S1885)

CAPACITORS

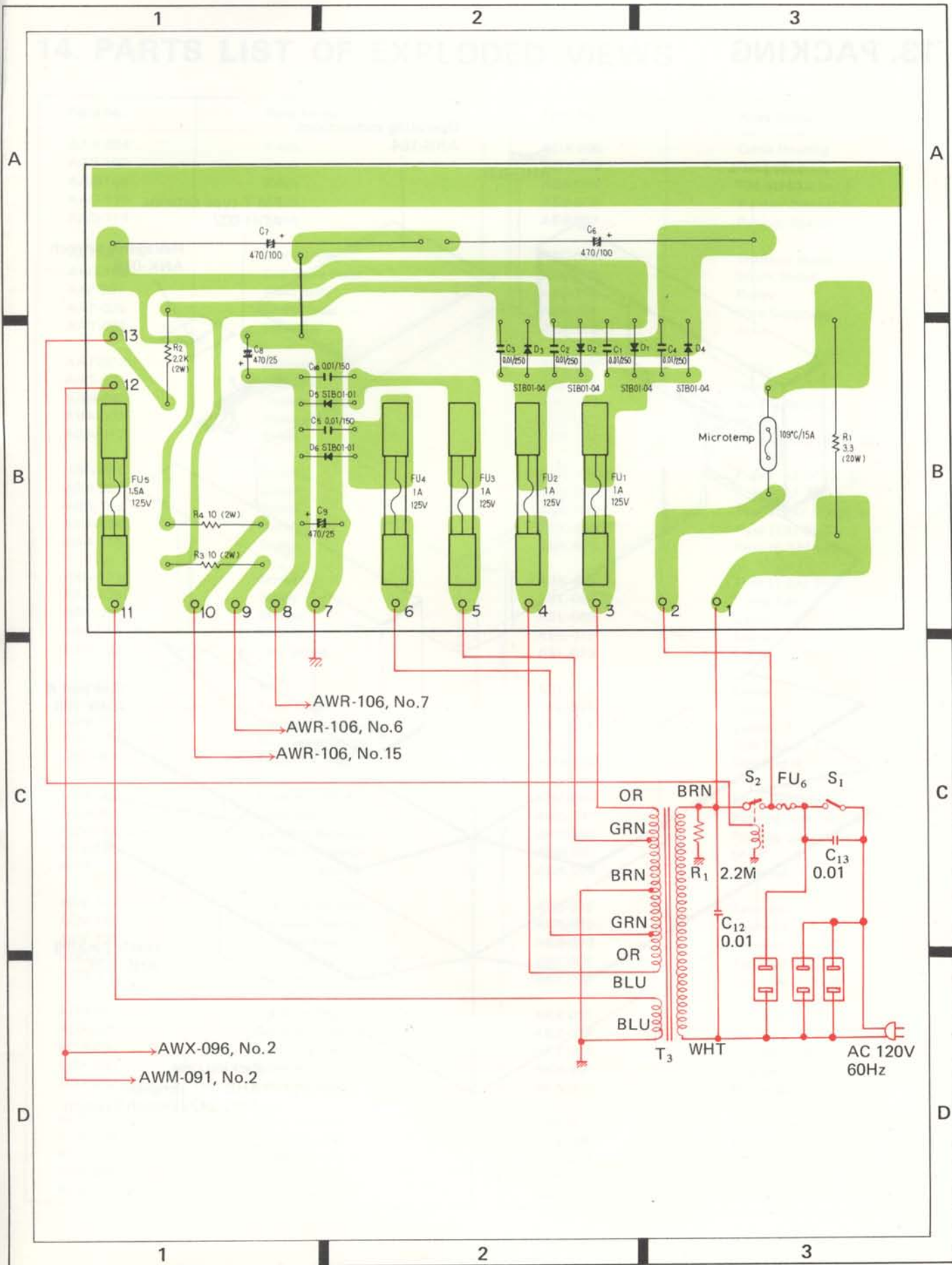
Symbol	Description	Part No.
C1	Ceramic 0.01 250V	ACG-001
C2	Ceramic 0.01 250V	ACG-001
C3	Ceramic 0.01 250V	ACG-001
C4	Ceramic 0.01 250V	ACG-001
C5	Ceramic 0.01 150V	ACG-004
C6	Electrolytic 470 100V	CEB 471P 100
C7	Electrolytic 470 100V	CEB 471P 100
C8	Electrolytic 470 25V	CEA 471P 25
C9	Electrolytic 470 25V	CEA 471P 25
C10	Ceramic 0.01 150V	ACG-004

RESISTORS

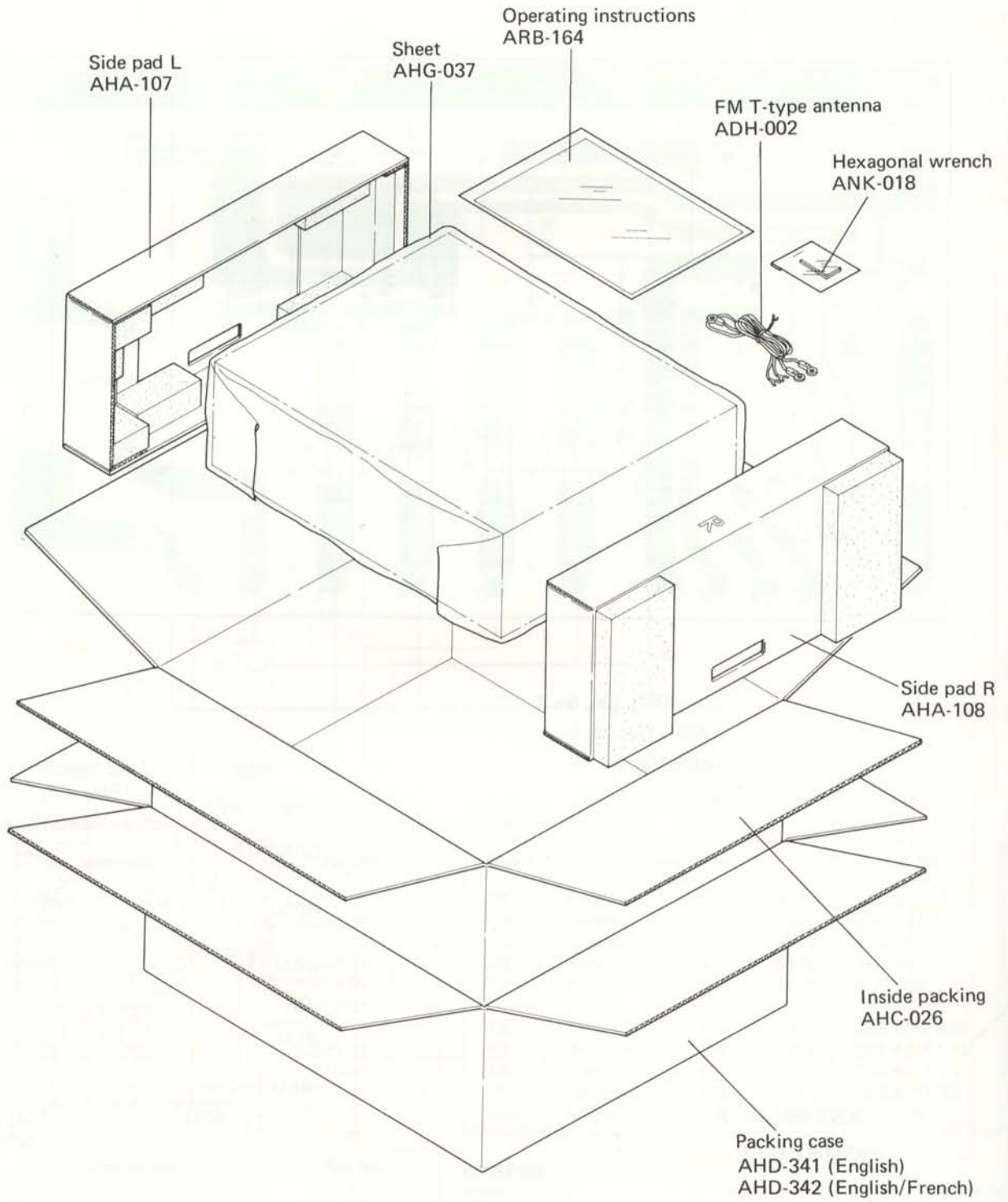
Symbol	Description	Part No.
R1	Wire wound 3.3 20W	ACN-003
R2	Metal oxide 2.2K 2W	RS2P 222J
R3	Metal oxide 10 2W	RS2P 100K
R4	Metal oxide 10 2W	RS2P 100K

OTHERS

Symbol	Description	Part No.
	Fuse clip	AKR-013
	Fuse clip	AKR-030
	MICROTEMP	AEX-005



13. PACKING



14. PARTS LIST OF EXPLODED VIEWS

Parts No.	Parts Name
AAA-034	Knob
AAB-100	Knob
AAB-104	Knob
AAD-113	Knob
AAD-114	Knob
AAF-051	Dial Pointer
AAG-106	Dial Scale Plate
AAP-037	Blind Sash
AAT-025	Shaft Cover
AAT-026	Indicator
AAT-027	Indicator
AAT-028	Indicator
AAW-040	Double Meter
ABA-002	Screw
ABA-012	Screw
ABA-081	Screw
ABA-087	Screw
ABA-113	Screw
ABA-114	Pulley Shaft
ABA-116	Screw
ABA-123	Screw
ABA-129	Screw
ABE-006	Washer
ABE-018	Washer
ABH-022	Coil Spring
ABN-021	Nut
ABN-022	Panel Base
ABN-023	Washer Faced Nut
ABN-024	Washer Faced Nut
ACG-001	Capacitor (HG, S)
ACG-003	Capacitor (KCU)
ACH-056	Capacitor
ACV-163	Variable Resistor
ACV-165	Variable Resistor
ACV-166	Variable Resistor
ACV-167	Variable Resistor
ACV-168	Variable Resistor
ACV-169	Variable Resistor
ADG-013	AC Power Cord (KCU)
ADG-015	AC Power Cord (S)
ADH-002	FM Antenna
ADX-029	Cable Housing
ADX-030	Cable Housing
ADX-031	Cable Housing
ADX-032	Cable Housing
ADX-033	Cable Housing
ADX-034	Cable Housing
ADX-035	Cable Housing
ADX-036	Cable Housing
ADX-037	Cable Housing

Parts No.	Parts Name
ADX-038	Cable Housing
ADX-039	Cable Housing
AEB-085	Rubber Bracket A
AEB-086	Rubber Bracket B
AEB-087	Rubber Spacer
AEC-076	Insulator Wafer
AEC-079	Strain Relief
AEC-101	Pulley
AEC-151	Wire Supporter
AEC-178	Foot
AEC-256	Pulley
AEC-258	Spacer
AEC-272	Acrylic Board
AED-018	Mask
AEK-104	Fuse (1.5A) (KCU, S)
AEK-106	Fuse (1A) (KCU, S)
AEK-109	Fuse (6A) (S)
AEK-301	Fuse (12A) (KCU, S)
AEK-402	Fuse (1A) (HG)
AEK-404	Fuse (6.3A) (HG)
AEK-405	Fuse (1.6A) (HG)
AEL-056	Lamp Ass
AEL-069	Lamp
AEL-072	Lamp
AEL-073	Lamp
AEL-074	Lamp
AEL-075	Lamp
AEL-076	Lamp
AHA-107	Side Pad L
AHA-108	Side Pad R
AHC-026	Inner Packing
AHD-341	Packing Case (KU, S, HG)
AHD-342	Packing Case (KC)
AHG-037	Sheet
AKA-004	Terminal
AKB-019	Terminal
AKB-030	Terminal
AKB-033	Terminal
AKC-030	Terminal Strip 2P
AKC-038	Terminal Strip 2P
AKE-012	Terminal
AKE-014	Terminal
AKF-053	Connecting Plate
AKH-001	Transistor Socket
AKN-010	Phone Jack
AKN-013	Phone Jack
AKP-005	AC Socket (KCU, S)
AKP-007	5P Connector Socket
AKP-008	AC Socket (HG)
AKR-028	Fuse Holder 1P

Parts No.	Parts Name
AKR-031	Plug in Selector
AKX-031	Plug in Selector
AMM-049	Wooden Cover
ANB-386	Front Panel Ass
ANE-105	Top Panel
ANK-018	Hexagonal Wrench
ARB-164	Operating Instruction
ARB-168	Operating Instruction
ARB-171	Operating Instruction
ARD-089	Operating Instruction
ASG-094	Push Switch
ASG-095	Push Switch
ASG-098	Push Switch
ASH-015	Slide Switch
ASK-080	Power Switch (KCU)
ASK-084	Lever Switch
ASK-090	Lever Switch
ASK-092	Lever Switch
ASK-099	Power Switch (S)
ASK-105	Power Switch (HG)
ASR-015	Relay
ATB-051	Ferrite Bar Antenna
ATT-267	Power Trans (KCU)
ATT-291	Power Trans (S)
ATT-295	Power Trans (HF)
AWB-023	FM Front End
AWE-068	Tuner Ass
AWF-021	EQ Amp Ass
AWG-041	Control Amp Ass
AWG-042	Flat Amp Ass
AWH-048	Power Amp Ass
AWM-089	Filter Amp Ass
AWM-091	Protection Ass
AWR-106	Stabilizer Ass
AWR-107	Power Supply Ass
AWR-108	Power Supply Ass
AWS-094	Function Switch Ass
AWS-095	Speaker Switch Ass
AWS-098	Speaker Switch Ass
AWX-062	5P Connector Ass
AWX-096	Lamp Board Ass
AWX-097	Mic Jack Ass
AWX-099	Switch Ass (KCU)
AWX-100	Switch Ass (S)
AXA-070	Tuning Drum Ass
AXA-111	Tuning Shaft Ass
B71-004	Nut
B71-010	Nut
M45-086	Washer
T22-025	Ferrite Balun

Parts No.	Parts Name
W72-092	Bar Antenna Holder
2SD555-R	Transistor
2SB600R	Transistor

15. SUPPLEMENTS FOR SX-1250/HG AND SX-1250/S

For servicing of the SX-1250/HG or S please refer to pp.4-100, with the exception of the power supply section and the de-emphasis selector which are described in this supplement.

15.1 CONTRAST OF MISCELLANEOUS-PARTS

FUSES

Symbol	Amp	Part No.			Remarks
		KCU type	HG type	S type	
FU1-4	1A	AEK-106	AEK-402	AEK-106	Secondary
FU5	1.5A 1.6A	AEK-104 .....	..... AEK-405	AEK-104	Lamp circuits
FU6	12A 6.3A 6A	AEK-301 ..... .....	..... AEK-404	AEK-301 AEK-109	Primary voltage : 110V, 120V Primary voltage : 220V, 240V Primary voltage : 220V, 240V

SWITCHES

Symbol	Part Name	Part No.			Remarks
		KCU type	HG type	S type	
S1	Lever switch	ASK-080	ASK-105	ASK-099	POWER
S3	Plug in selector (Line voltage selector)	..... .....	AKX-037 .....	..... AKR-031	2-position 4-position with fuse holder

TRANSFORMER

Symbol	Part Name	Part No.			Remarks
		KCU type	HG type	S type	
T3	Power Transformer	ATT-267	ATT-295	ATT-291	

RESISTOR

Symbol	Part Name	Part No.			Remarks
		KCU type	HG type	S type	
R1	Carbon film 2.2M $\frac{1}{2}$ W	RD $\frac{1}{2}$ PS 225J	.....	.....

CAPACITORS

Symbol	Part Name	Part No.			Remarks
		KCU type	HG type	S type	
C12	Ceramic 0.01 150V	ACG-003	.....	.....	DC1.4kV
	Ceramic 0.01 250V	.....	ACG-001	ACG-001	
C13	Ceramic 0.01 150V	ACG-003	.....	.....	DC1.4kV
	Ceramic 0.01 250V	.....	.....	ACG-001	
C15	Polystyrene 510p 50V	.....	CQSA511J50	.....
C16	Polystyrene 510p 50V	.....	CQSA511J50	.....
C17	Ceramic 56p 50V	.....	CCDSL560K50	.....

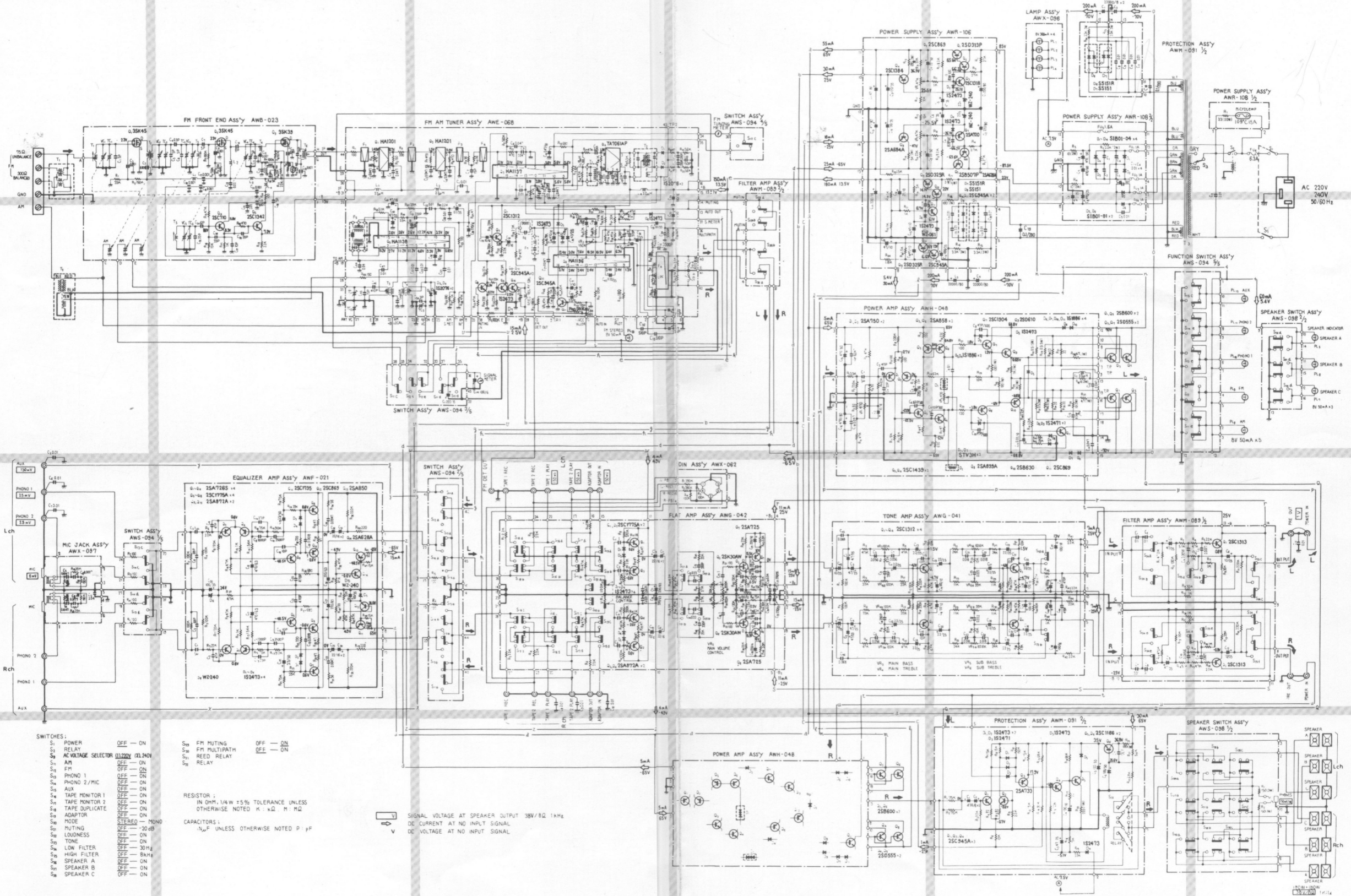
P.C. BOARD ASSEMBLIES

Part Name	Part No.			Remarks
	KCU type	HG type	S type	
De-emphasis switch assembly	AWX-099 .....	..... .....	..... AWX-101	2-position (25μs/75μs) 3-position (25μs/50μs/75μs)
Power supply assembly	AWR-107	AWR-108	AWR-107	
Speakers switch assembly	AWS-095	AWS-098	AWS-095	

OTHERS

Part Name	Part No.			Remarks
	KCU type	HG type	S type	
AC power cord	ADG-013	.....	ADG-015	
AC socket (OUTLET) AC socket (INLET)	AKP-005 .....	..... AKP-008	AKP-005	
Operating instructions	ARB-164	ARB-171 ARD-089	ARB-168	English German/French

15.3 SCHEMATIC DIAGRAM FOR SX-1250/HG

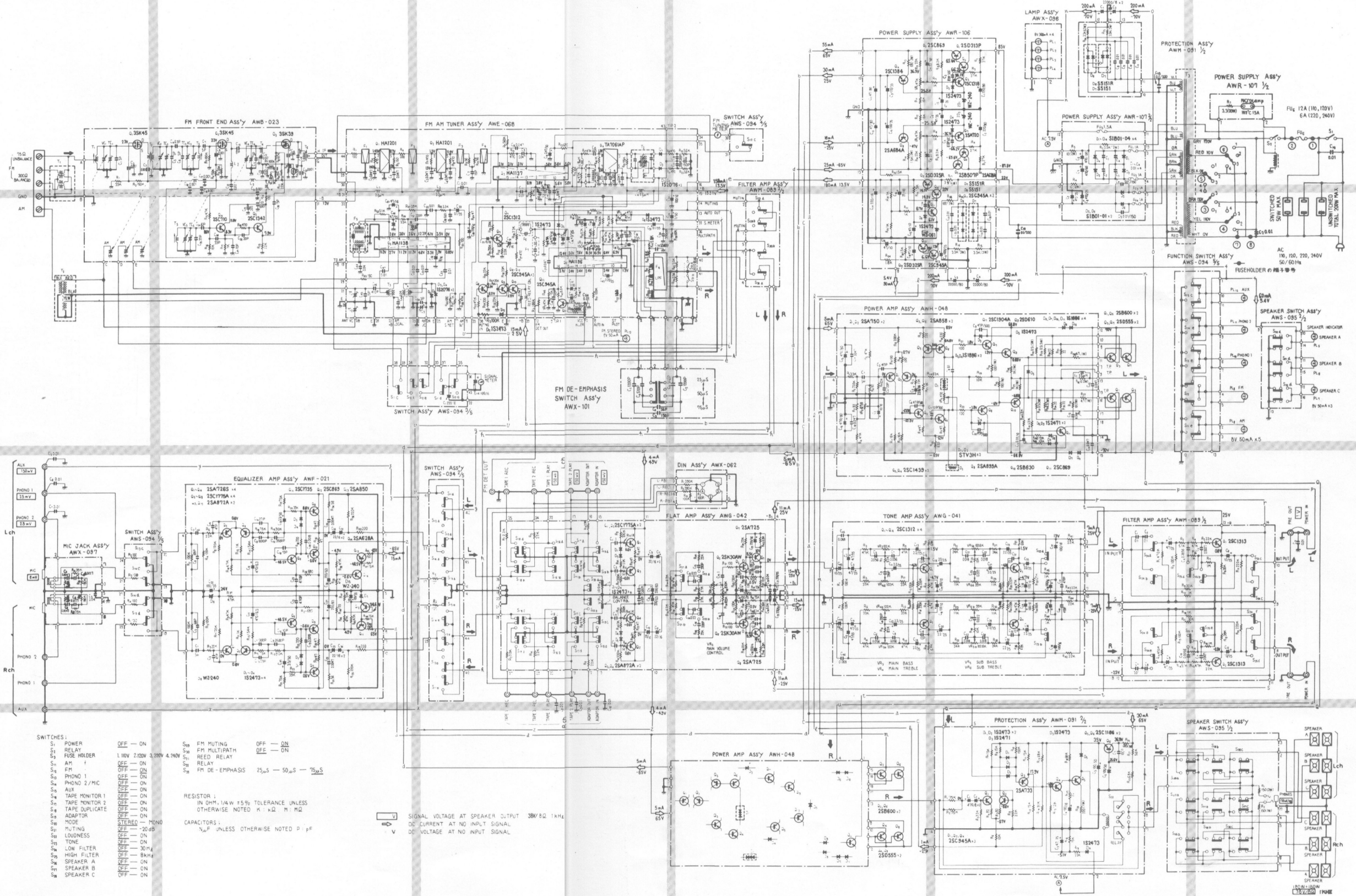


- SWITCHES:**
- S₁ POWER OFF — ON
 - S₂ RELAY OFF — ON
 - S₃ AC VOLTAGE SELECTOR (110/220V) (11/240V)
 - S₄ AM OFF — ON
 - S₅ FM OFF — ON
 - S₆ PHONO 1 OFF — ON
 - S₇ PHONO 2/MIC OFF — ON
 - S₈ AUX OFF — ON
 - S₉ TAPE MONITOR 1 OFF — ON
 - S₁₀ TAPE MONITOR 2 OFF — ON
 - S₁₁ TAPE DUPLICATE OFF — ON
 - S₁₂ ADAPTOR OFF — ON
 - S₁₃ MODE STEREO — MONO
 - S₁₄ MUTING OFF — ON
 - S₁₅ LOUDNESS OFF — ON
 - S₁₆ TONE OFF — ON
 - S₁₇ LOW FILTER OFF — ON
 - S₁₈ HIGH FILTER OFF — ON
 - S₁₉ SPEAKER A OFF — ON
 - S₂₀ SPEAKER B OFF — ON
 - S₂₁ SPEAKER C OFF — ON

- RESISTOR:**
IN OHM, 1/4W ±5% TOLERANCE UNLESS OTHERWISE NOTED K, kΩ, M, MΩ
- CAPACITORS:**
μF, UNLESS OTHERWISE NOTED P, pF

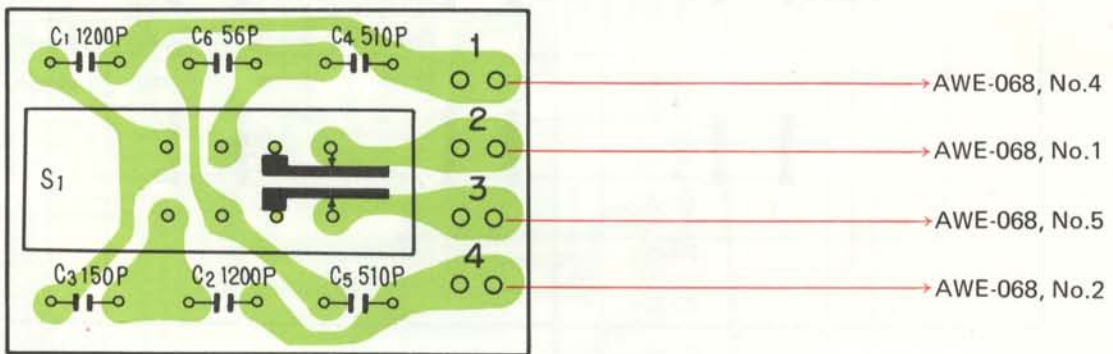
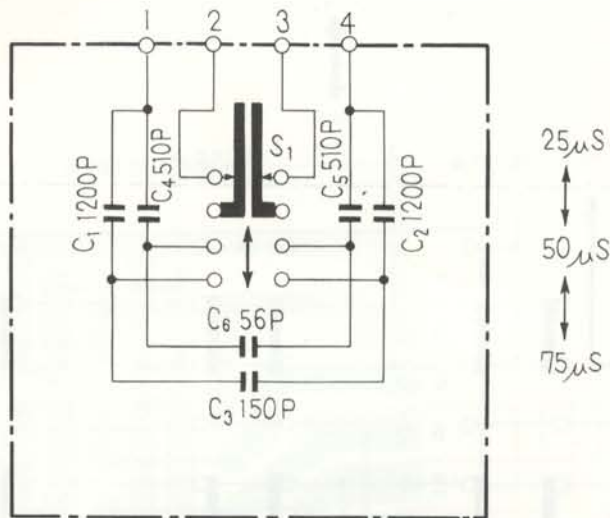
⊖ V SIGNAL VOLTAGE AT SPEAKER OUTPUT 38V/5Ω 1kHz
 ⊖ V DC CURRENT AT NO INPUT SIGNAL
 ⊖ V DC VOLTAGE AT NO INPUT SIGNAL

15.2 SCHEMATIC DIAGRAM FOR SX-1250/S



- SWITCHES:**
- S₁ POWER OFF - ON
 - S₂ RELAY OFF - ON
 - S₃ FUSE HOLDER 1.10V 2.02V 3.20V 4.14V
 - S₄ AM 1 OFF - ON
 - S₅ FM OFF - ON
 - S₆ PHONO 1 OFF - ON
 - S₇ PHONO 2/MIC OFF - ON
 - S₈ AUX OFF - ON
 - S₉ TAPE MONITOR 1 OFF - ON
 - S₁₀ TAPE MONITOR 2 OFF - ON
 - S₁₁ TAPE DUPLICATE OFF - ON
 - S₁₂ ADAPTOR OFF - ON
 - S₁₃ MODE STEREO - MONO
 - S₁₄ MUTING OFF - ON
 - S₁₅ LOUDNESS OFF - ON
 - S₁₆ TONE OFF - ON
 - S₁₇ LOW FILTER OFF - ON
 - S₁₈ HIGH FILTER OFF - ON
 - S₁₉ SPEAKER A OFF - ON
 - S₂₀ SPEAKER B OFF - ON
 - S₂₁ SPEAKER C OFF - ON
- RESISTOR:**
IN OHM, 1/4W +5% TOLERANCE UNLESS OTHERWISE NOTED K: kΩ M: MΩ
- CAPACITORS:**
μF UNLESS OTHERWISE NOTED P: pF
- Legend:**
V SIGNAL VOLTAGE AT SPEAKER OUTPUT 38V/5Ω 1kHz
DC CURRENT AT NO INPUT SIGNAL
DC VOLTAGE AT NO INPUT SIGNAL

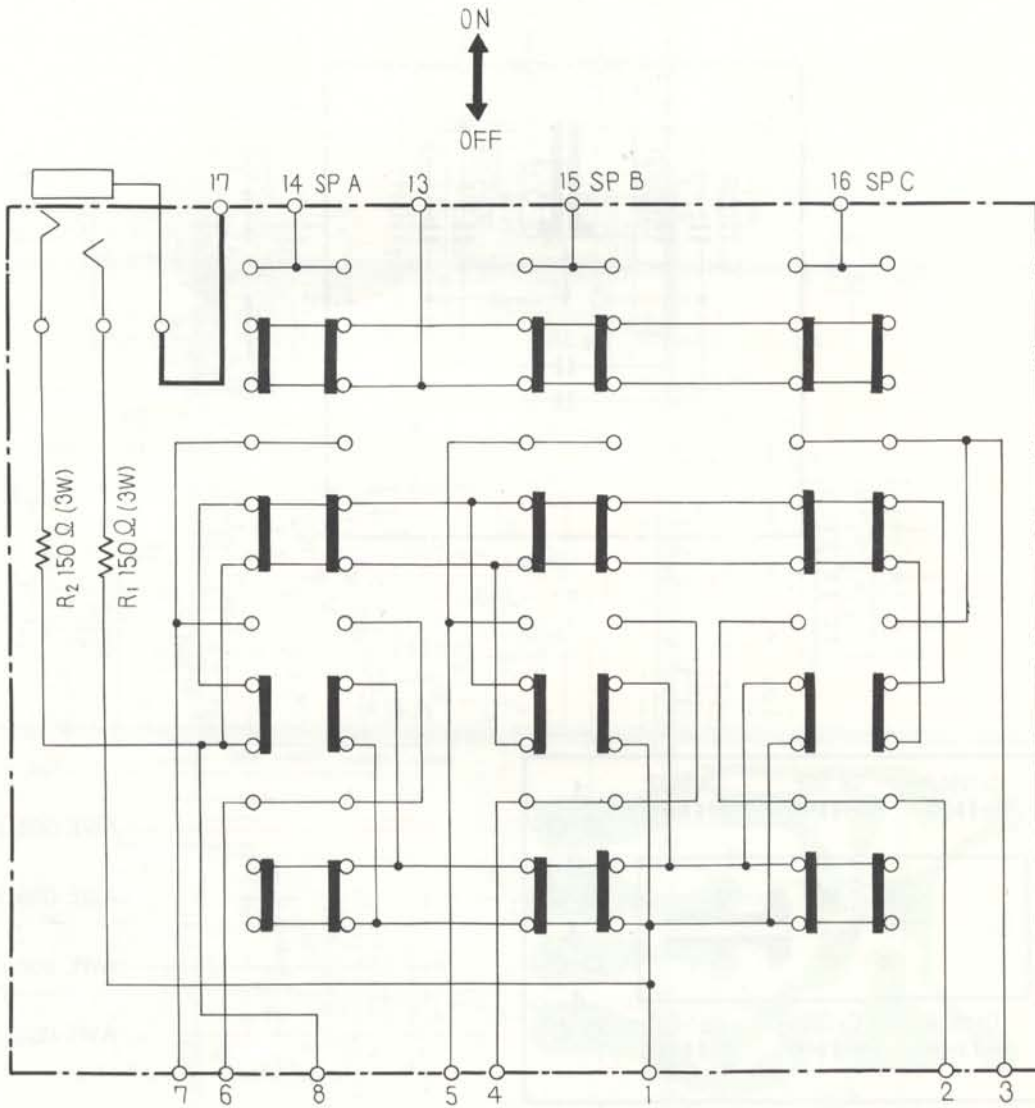
15.4 DE-EMPHASIS SWITCH ASSEMBLY (AWX-101, for S type)



Parts List of De-emphasis Switch Assembly (AWX-101, for S type)

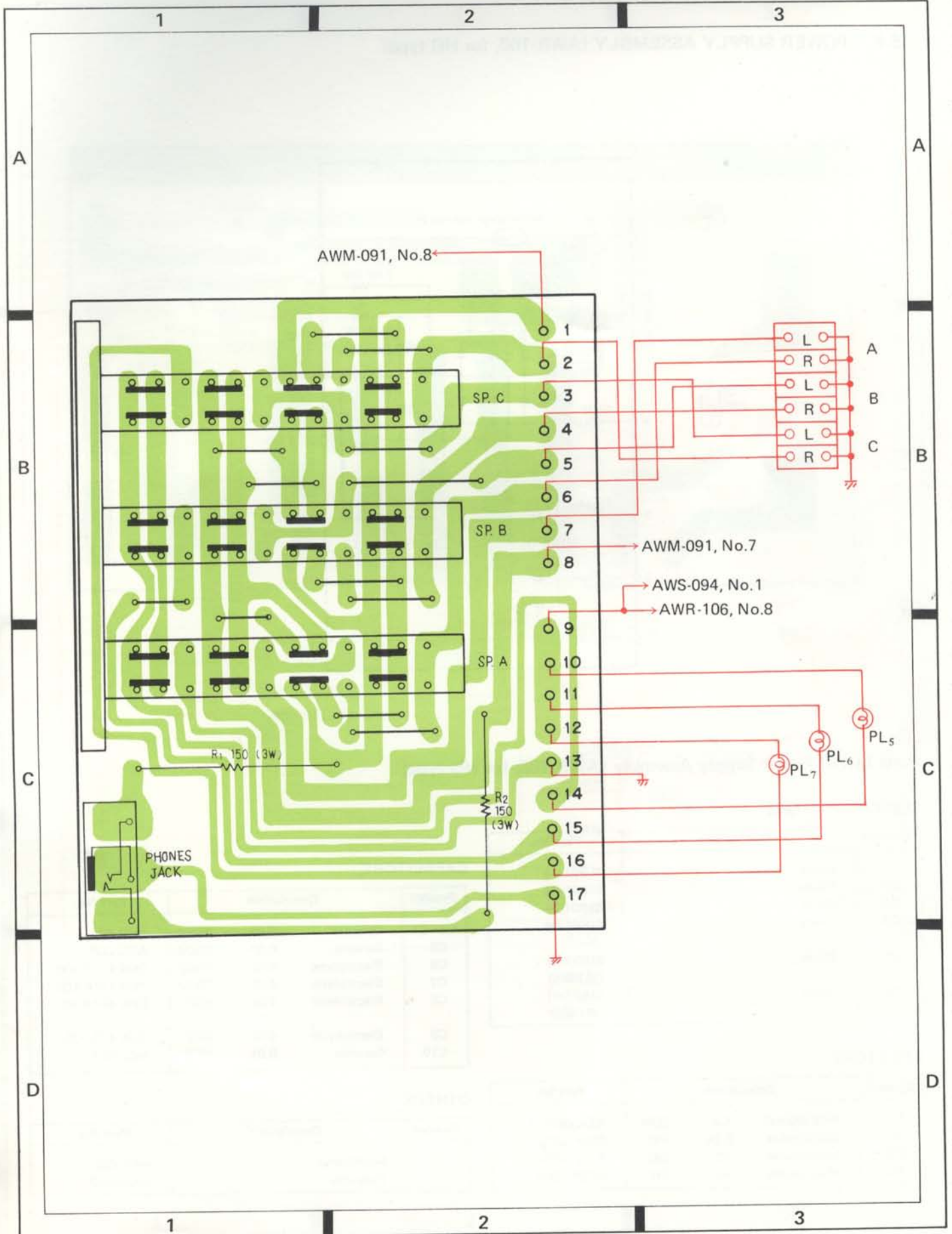
Symbol	Description	Part No.
S1	Slide switch (DE-EMPHASIS)	ASH-017
C1	Ceramic 1200p 50V	CKDYA 122J 50
C2	Ceramic 1200p 50V	CKDYA 122J 50
C3	Ceramic 150p 50V	CCDSL 151K 50
C4	Polystyrene 510p 50V	CQSA 511J 50
C5	Polystyrene 510p 50V	CQSA 511J 50
C6	Ceramic 56p 50V	CCDSL 560K 50

15.5 SPEAKERS SWITCH ASSEMBLY (AWS-098, for HG type)

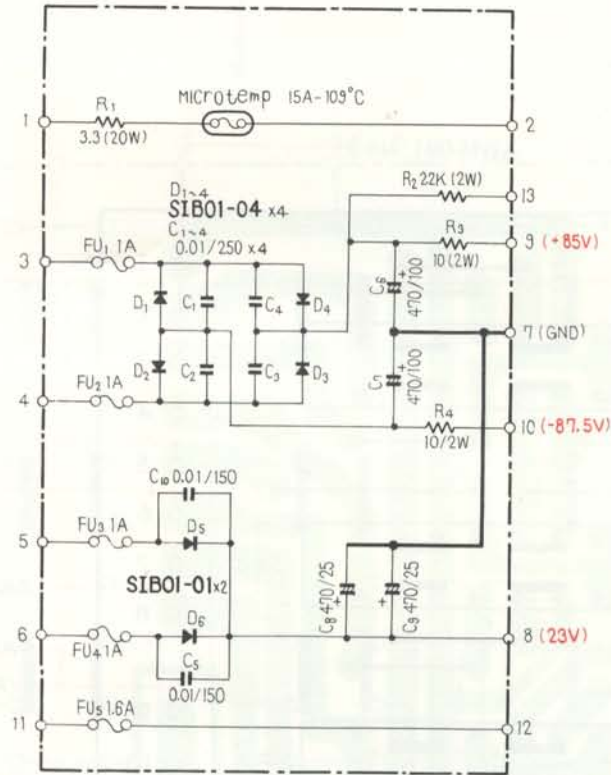


Parts List of Speaker Switch Assembly (AWS-098, for HG type)

Symbol	Description	Part No.
S1	Push switch (SPEAKERS)	ASG-100
R1	Metal oxide resistor 150 3W	RS3P 151K
R2	Metal oxide resistor 150 3W	RS3P 151K
	Phone jack (PHONES)	AKN-010



15.6 POWER SUPPLY ASSEMBLY (AWR-108, for HG type)



Parts List of Power Supply Assembly (AWR-108, for HG type)

SEMICONDUCTORS

Symbol	Description	Part No.
D1	Diode	SIB01-04
D2	Diode	SIB01-04
D3	Diode	SIB01-04
D4	Diode	SIB01-04
D5	Diode	SIB01-01 (IS1885)
D6	Diode	SIB01-01 (IS1885)

CAPACITORS

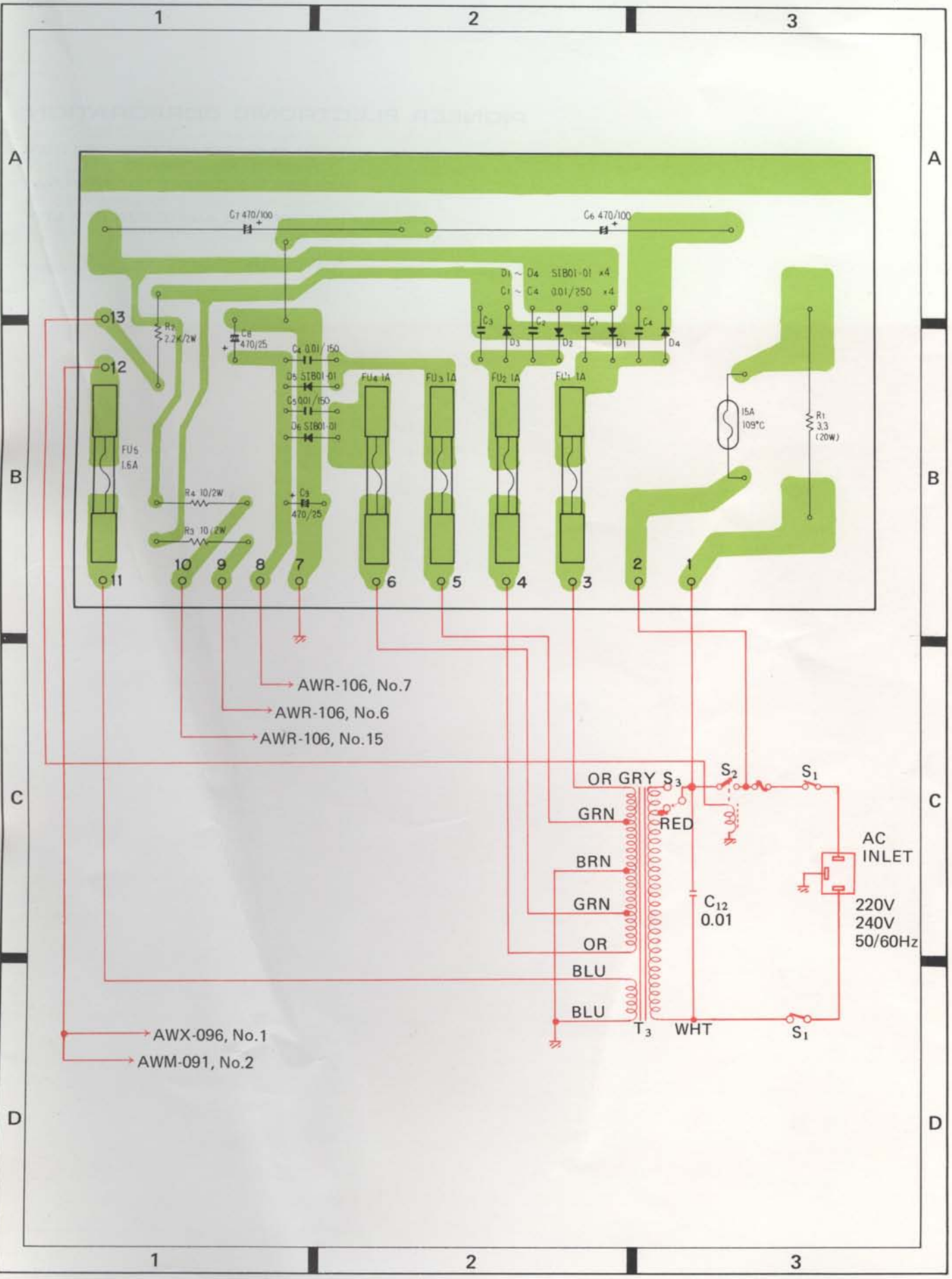
Symbol	Description	Part No.
C1~C4	Ceramic 0.01 250V	ACG-001
C5	Ceramic 0.01 150V	ACG-004
C6	Electrolytic 470 100V	CEB 471P 100
C7	Electrolytic 470 100V	CEB 471P 100
C8	Electrolytic 470 25V	CEA 471P 25
C9	Electrolytic 470 25V	CEA 471P 25
C10	Ceramic 0.01 150V	ACG-004

RESISTORS

Symbol	Description	Part No.
R1	Wire wound 3.3 20W	ACN-003
R2	Metal oxide 2.2k 2W	RS2P 222J
R3	Metal oxide 10 2W	RS2P 100K
R4	Metal oxide 10 2W	RS2P 100K

OTHERS

Symbol	Description	Part No.
	Microtemp	AEX-005
	Fuse clip	AKR-010



→ AWR-106, No.7
 → AWR-106, No.6
 → AWR-106, No.15

→ AWX-096, No.1
 → AWM-091, No.2

AC INLET
 220V
 240V
 50/60Hz

PIONEER ELECTRONIC CORPORATION

4-3, Meguro 1-Chome, Meguro-Ku, Tokyo 153, Japan

U.S. PIONEER ELECTRONICS CORPORATION

25 Oxford Drive, Mahwah, New Jersey 07074, U.S.A.

PIONEER ELECTRONIC (EUROPE) N.V.

Luithuidersteeweg, no. 9, 2030 Antwerp, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY. LTD.

178-184 Boundary Road, Braeside, Victoria 3195, Australia

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Printed in Japan

1

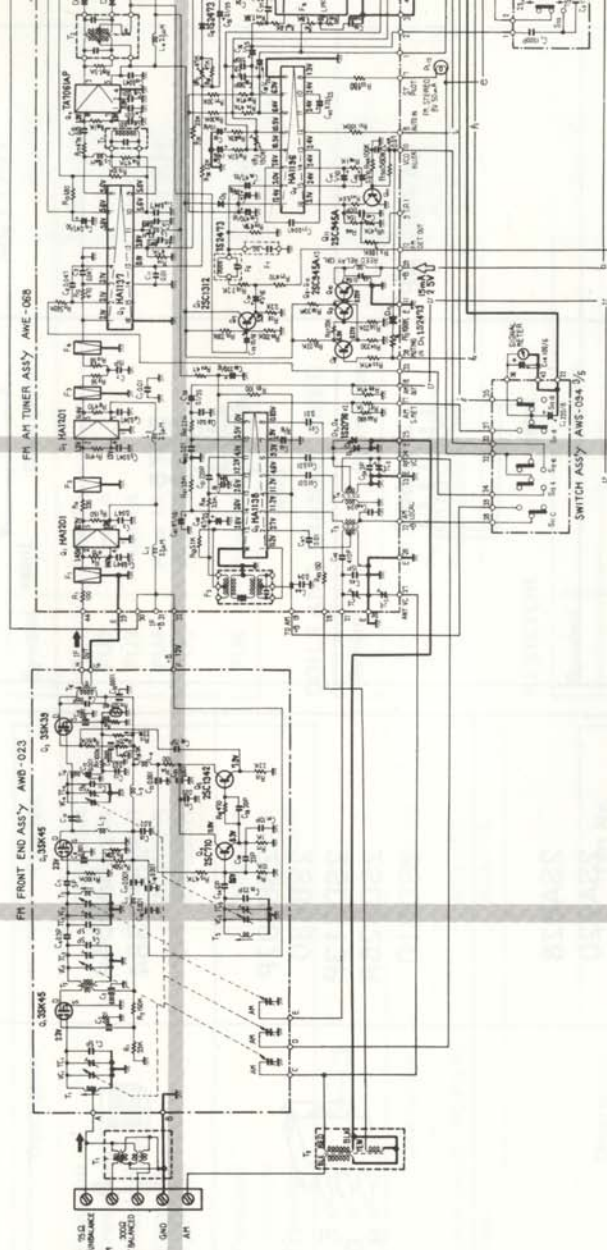
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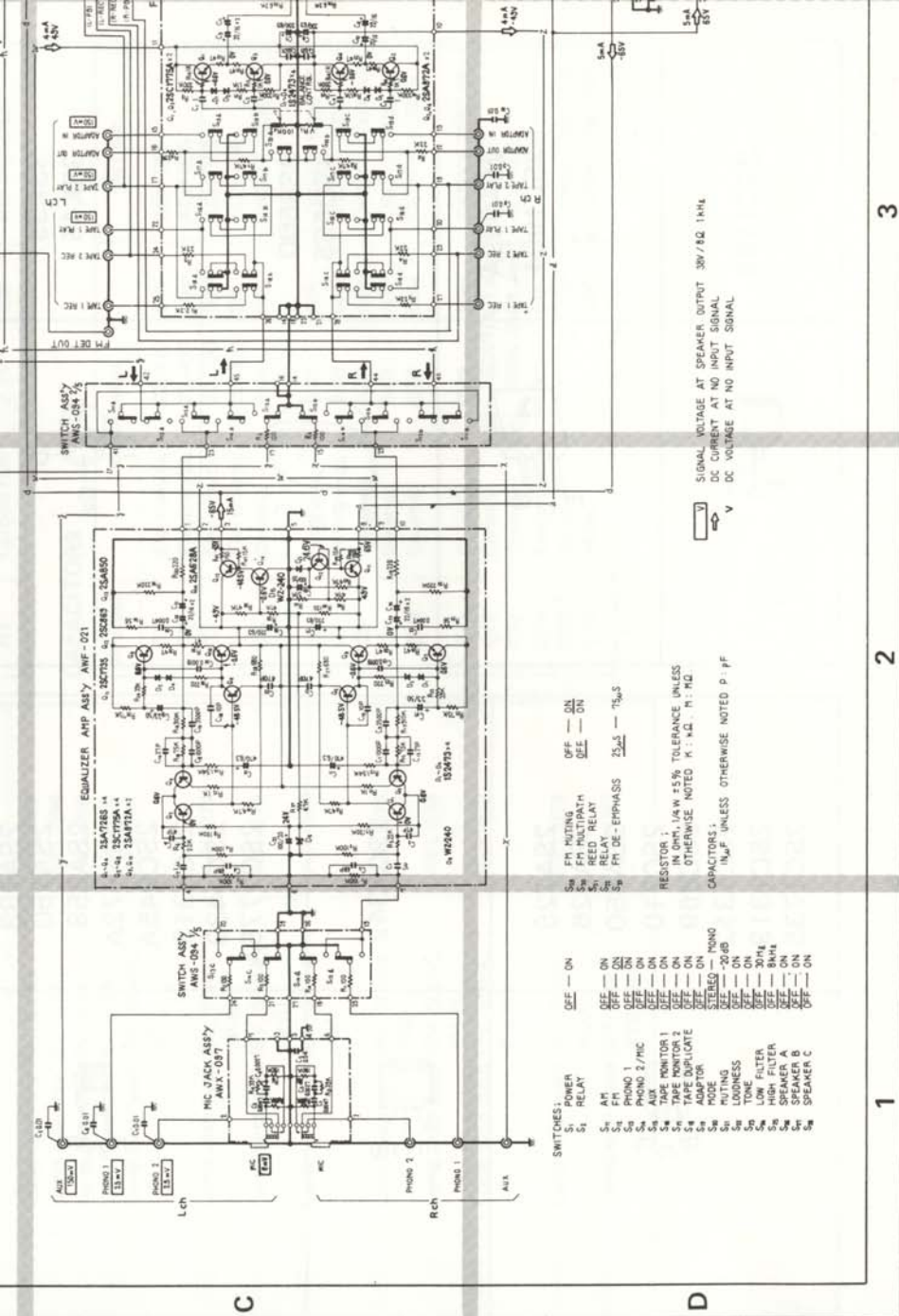
3

12.2 SCHEMATIC DIAGRAM

A

B





EQUALIZER AMP ASY AWF-021
 6-4 32AT8B 1-4
 6-4 32CT79A 1-4
 6-4 32A7T1A 1-1

SWITCH ASY
 AWS-084

MIC JACK ASY
 AWX-087

DETECTOR ASY
 AWD-020

DETECTOR AND AMP ASY
 AWD-021

DETECTOR AND AMP ASY
 AWD-022

DETECTOR AND AMP ASY
 AWD-023

- SWITCHES:
- POWER OFF — ON
 - RELAY OFF — ON
 - FM OFF — ON
 - FM MULTIPATH OFF — ON
 - REED RELAY OFF — ON
 - FM DE-EMPHASIS 25.5 — 75.5
 - PHONO 1 OFF — ON
 - PHONO 2/HIC OFF — ON
 - AUX OFF — ON
 - TAPE MONITOR 1 OFF — ON
 - TAPE MONITOR 2 OFF — ON
 - TAPE DUPLICATE OFF — ON
 - ADAPTOR OFF — ON
 - MUTING OFF — ON
 - LOADNESS OFF — ON
 - 2000 OFF — ON
 - LOW FILTER OFF — ON
 - 20K OFF — 20K
 - 20K OFF — 20K
 - SPEAKER A OFF — ON
 - SPEAKER B OFF — ON
 - SPEAKER C OFF — ON

RESISTORS:
 IN OHM, 1/4W ±5% TOLERANCE UNLESS
 OTHERWISE NOTED. K: K. Ω: Ω. M: M. Q: Q.

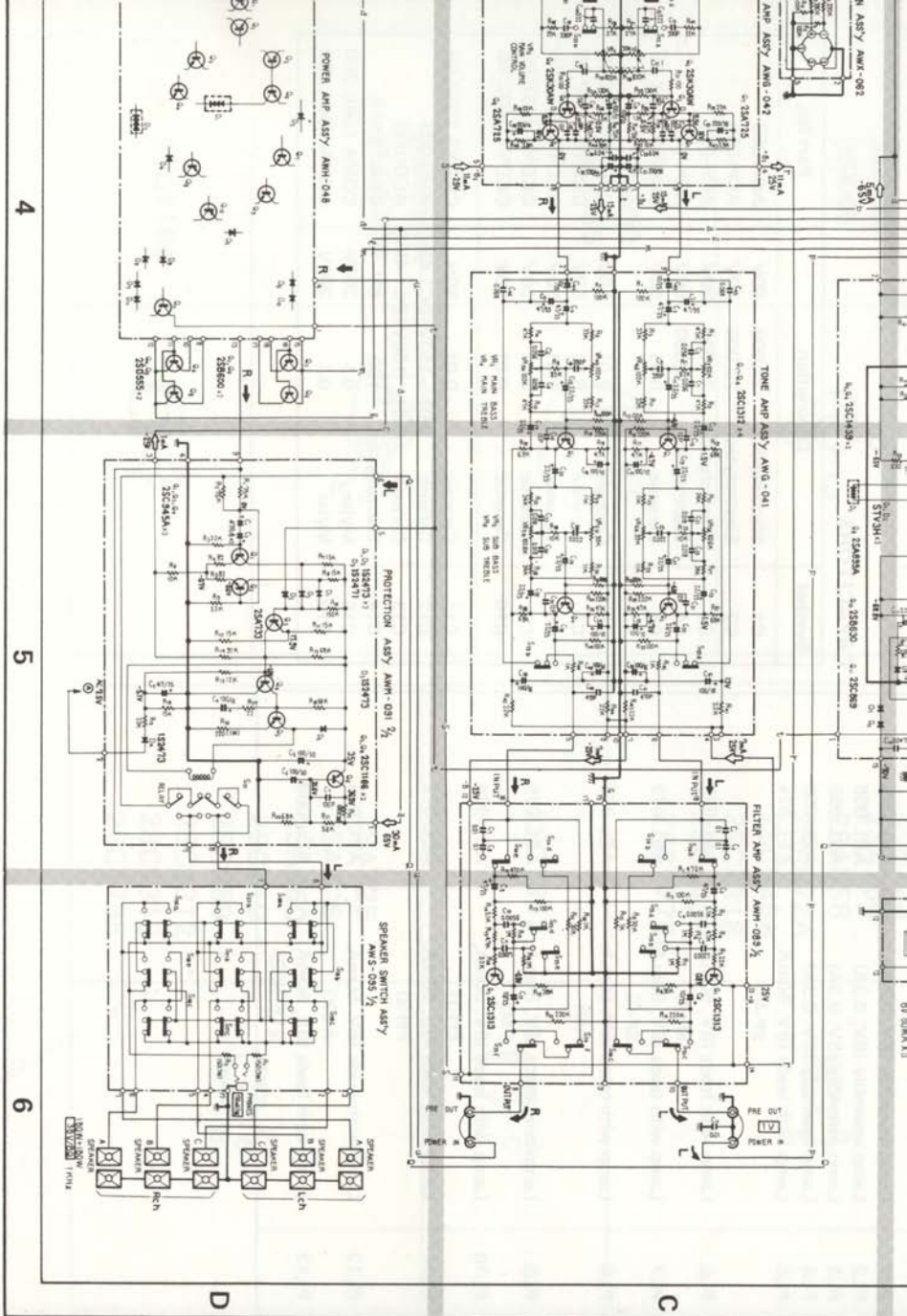
CAPACITORS:
 100P UNLESS OTHERWISE NOTED. P: pF

SIGNAL VOLTAGE AT SPEAKER OUTPUT 30V/1KHZ
 DC CURRENT AT NO INPUT SIGNAL
 DC VOLTAGE AT NO INPUT SIGNAL

3

2

1



4

5

6

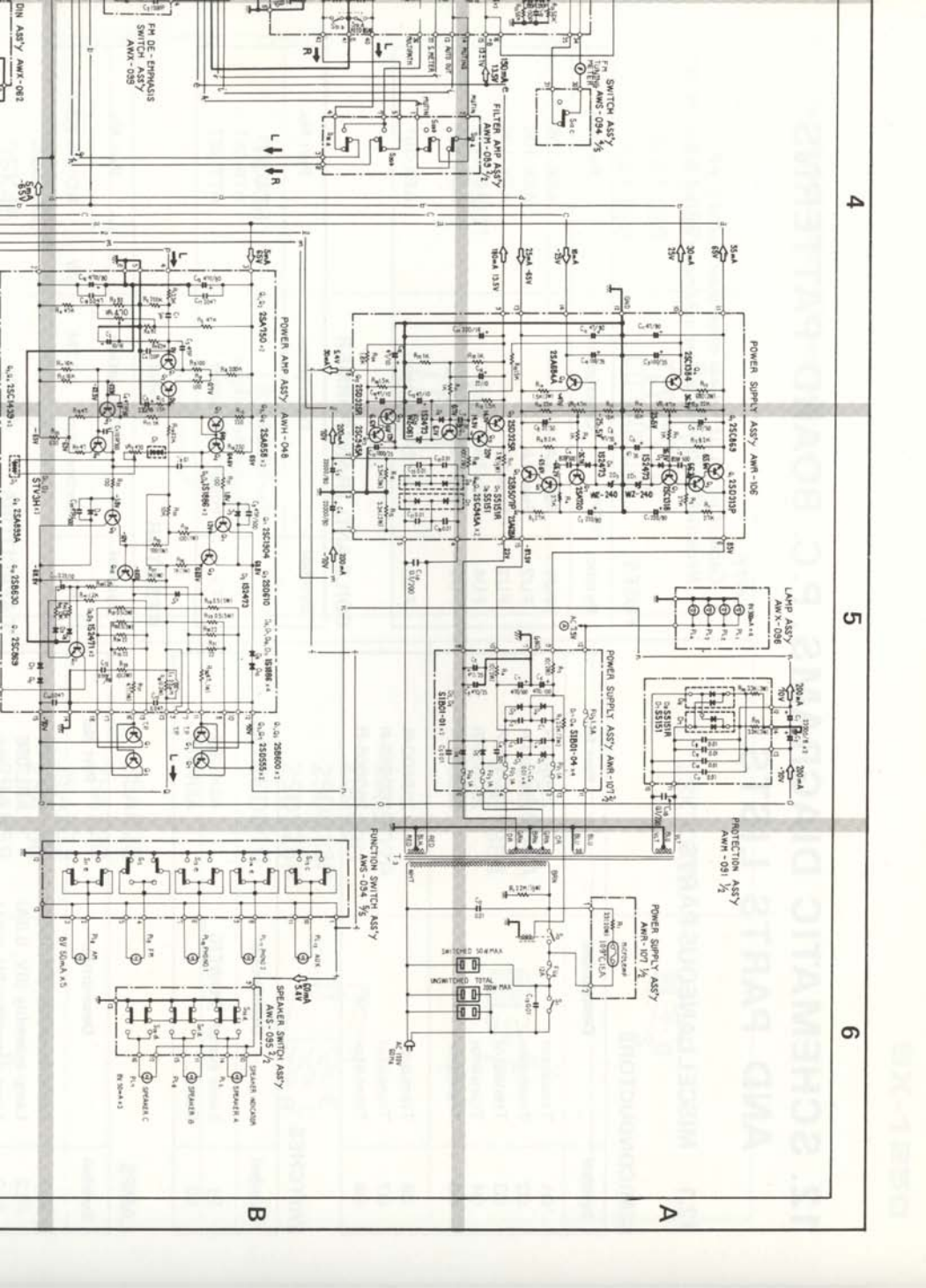
D

C

4

5

6



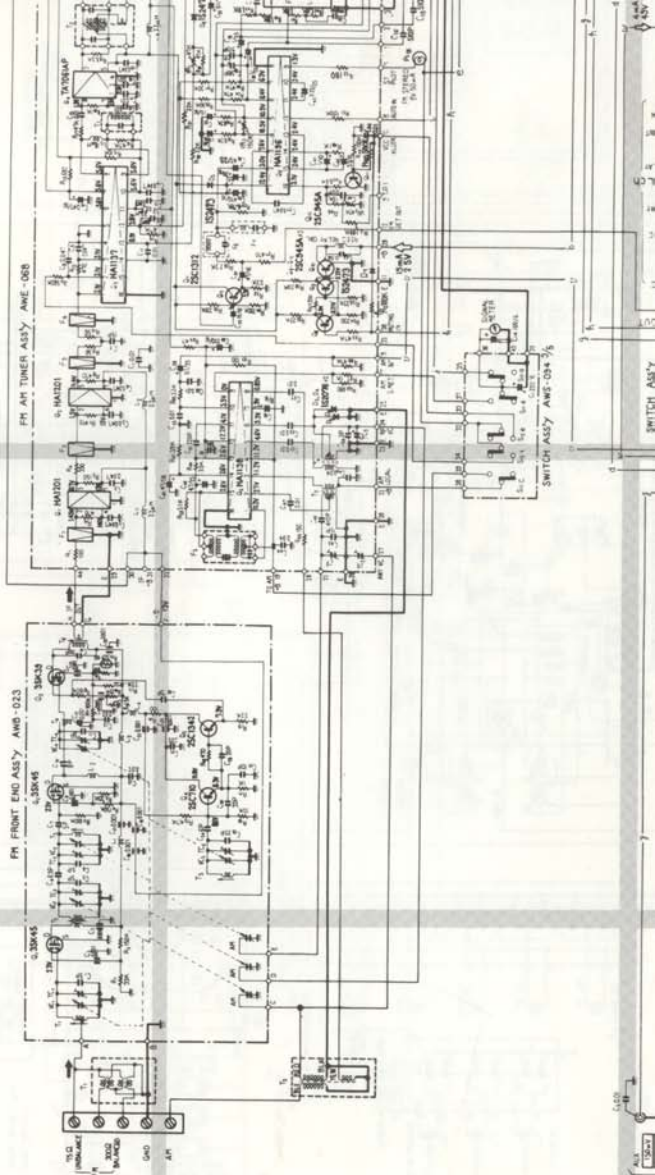
PM DC-EMPHASIS
SWAMP-035
AMN-035

50A
220V

B

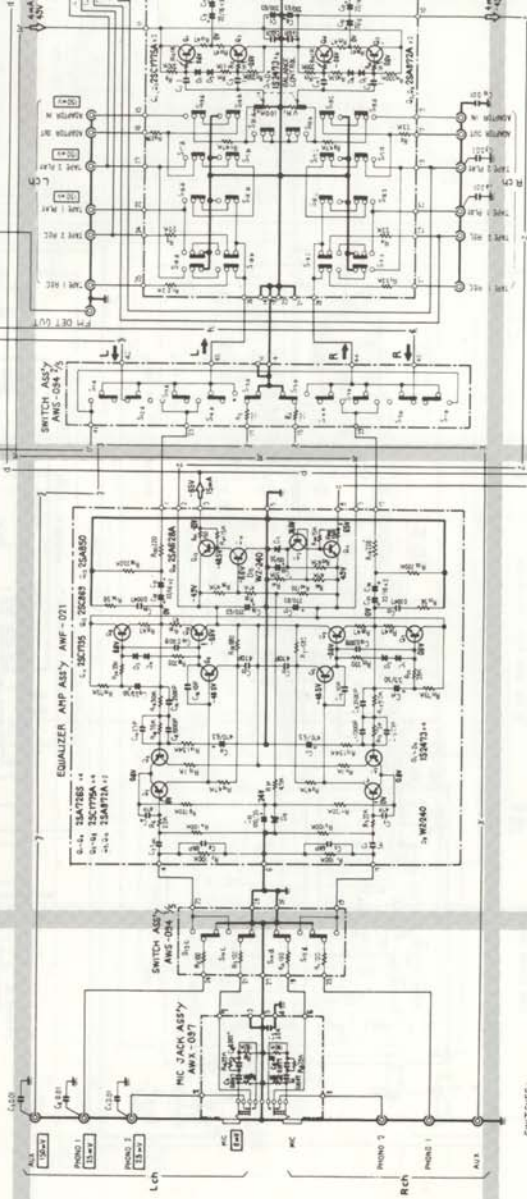
A

15.3 SCHEMATIC DIAGRAM FOR SX-1250/HG



A

B



- SWITCHES:
- | | | |
|-----|--------------------|-------------|
| 1. | POWER | OFF — ON |
| 2. | VOLUME | DEF — ON |
| 3. | AUTOMATIC SELECTOR | DEF — ON |
| 4. | ATT | DEF — ON |
| 5. | PH | DEF — ON |
| 6. | PHONO 1 | DEF — ON |
| 7. | PHONO 2 | DEF — ON |
| 8. | PHONO 3 / MIC | DEF — ON |
| 9. | TAPK MONITOR 1 | DEF — ON |
| 10. | TAPK MONITOR 2 | DEF — ON |
| 11. | TAPE MONITOR | DEF — ON |
| 12. | ADAPTOR | DEF — ON |
| 13. | MODE | STAY — PONO |
| 14. | MUTING | DEF — 20dB |
| 15. | BASS | DEF — ON |
| 16. | TONE | DEF — ON |
| 17. | LOW FILTER | DEF — 30MHz |
| 18. | HIGH FILTER | DEF — 8MHz |
| 19. | SPEAKER A | DEF — ON |
| 20. | SPEAKER B | DEF — ON |
| 21. | SPEAKER C | DEF — ON |

- 5m PF MUTING
 5m PF MULTIPATH
 5m RELEED RELAY
 5m RELAY

RESISTOR:
 IN OHM, 1/4W 5% TOLERANCE UNLESS
 OTHERWISE NOTED K, M, P, HZ
 CAPACITORS:
 UNLESS OTHERWISE NOTED P, F

—V—
 V
 SIGNAL VOLTAGE AT SPEAKER OUTPUT 30V/40 1/4W
 DC CURRENT AT NO INPUT SIGNAL
 DC VOLTAGE AT NO INPUT SIGNAL

C

D

1

2

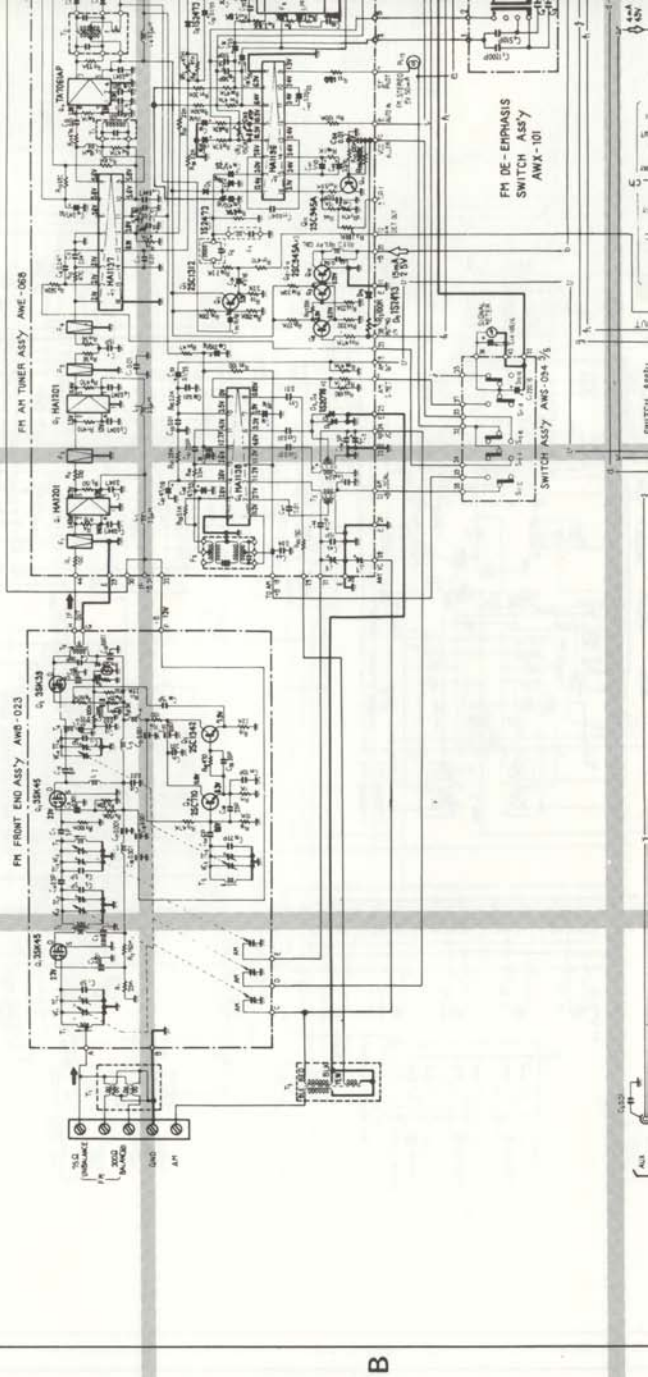
3

1

2

3

15.2 SCHEMATIC DIAGRAM FOR SX-1250/S

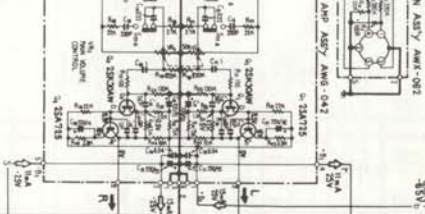


A

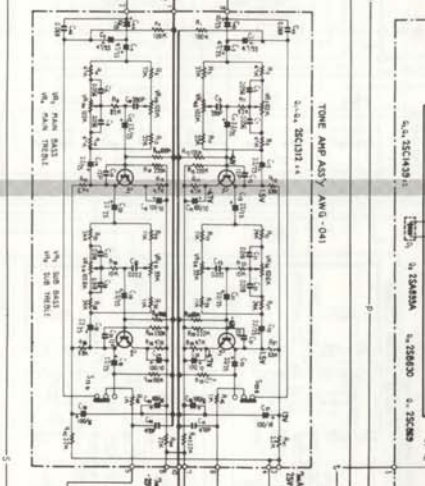
B

N. ASST. AMPL. ASSY - 081

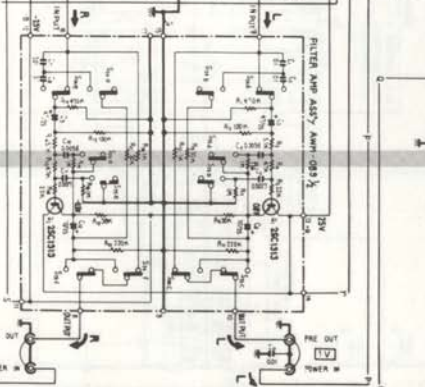
AMP. ASSY. AMB - 042



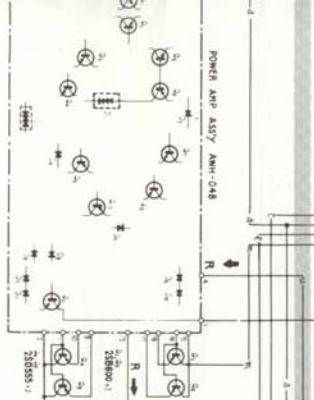
TONE AMP. ASSY. AMB - 041



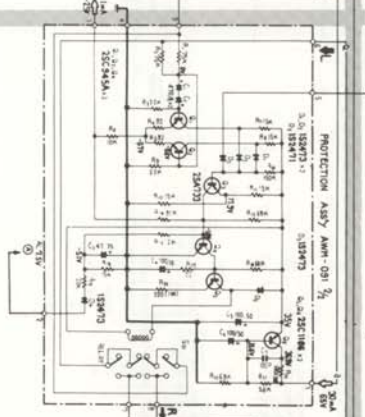
FILTER AMP. ASSY. AMB - 081 1/2



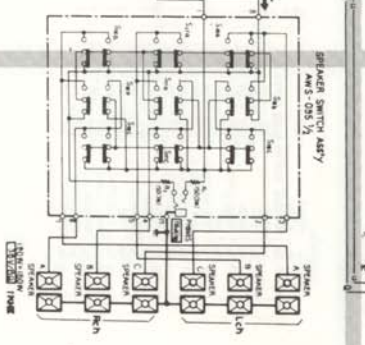
POWER AMP. ASSY. AMB - 048



PROTECTION ASSY. AMB - 091 1/2



SPEAKER SWITCH ASSY. AMB - 095 1/2



6X5

6X4

6X4

6X4

6X4

4

5

6

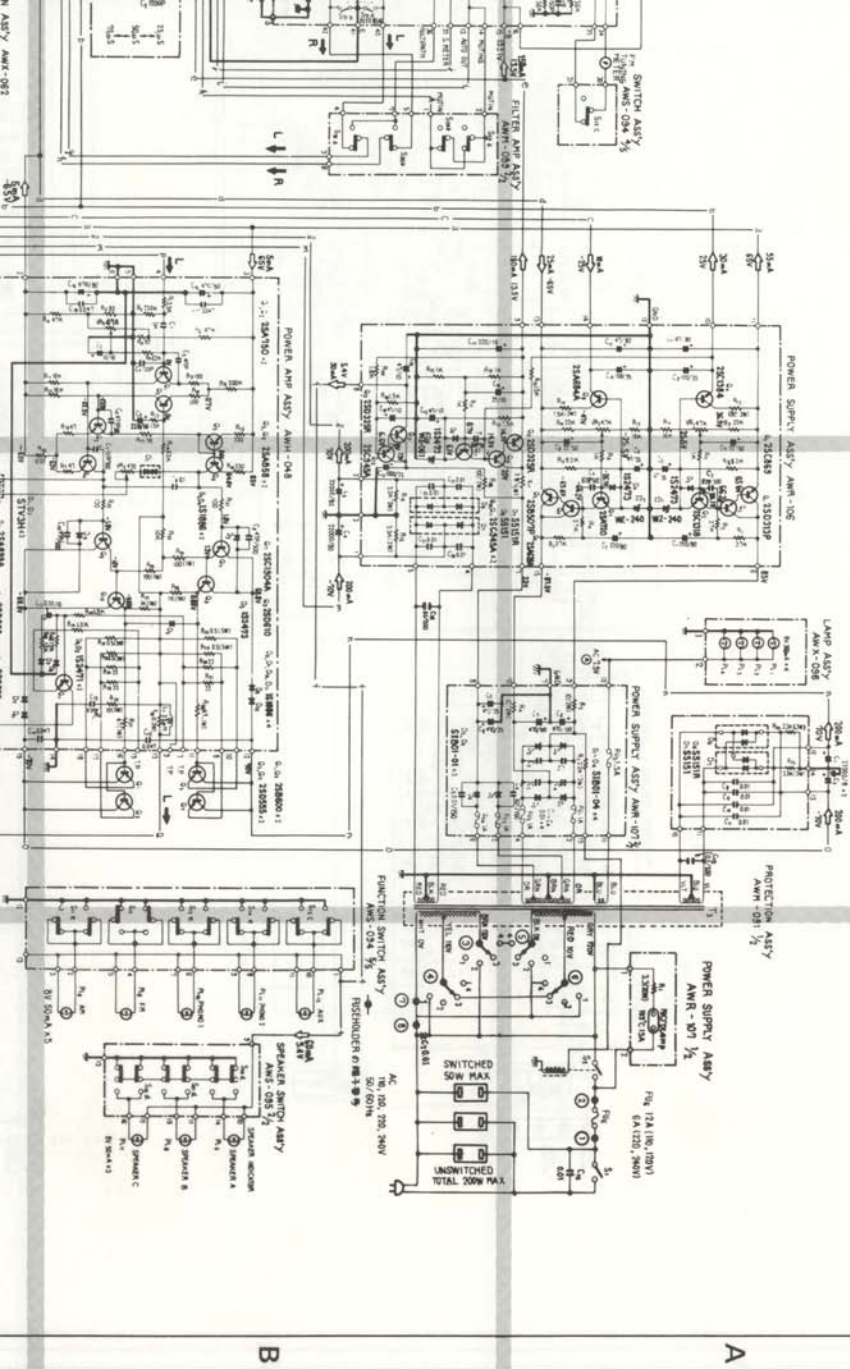
D

C

4

5

6



A

B

ASSY AM-105